THE

JOURNAL OF GAS LIGHTING,

WATER SUPPLY, & SANITARY IMPROVEMENT.

VOL. XVI. No. 376—19th YEAR.] LONDON, MARCH 19, 1867. [Subscription per Ann. 15s. in Advance 18s. Credit. DOUBLE No. Price 1s.

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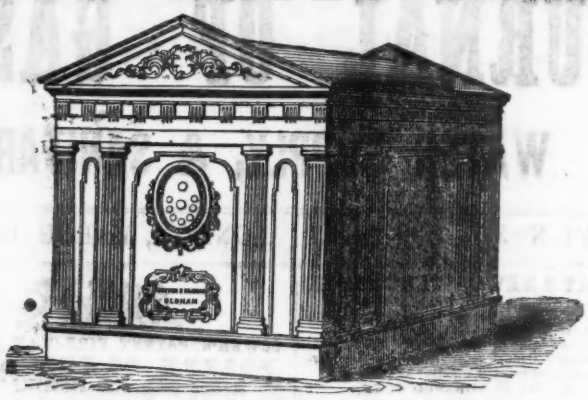

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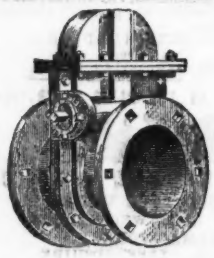

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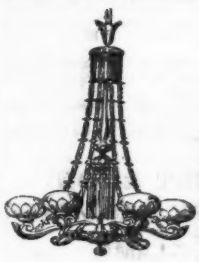

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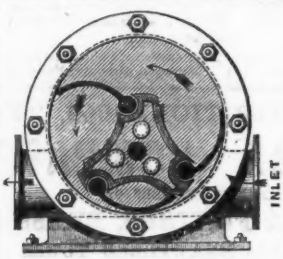

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THE JOURNAL OF GAS LIGHTING,

WATER SUPPLY, & SANITARY IMPROVEMENT.

TUESDAY, MARCH 19, 1867.

Notes upon Passing Events.

THE Lords committee on Mr. France's pamphlet against Lord Redesdale has made its report. The Lords have discussed the contents, and come to exactly the conclusion we expected. They decide that Lord Redesdale only exercised powers he had a right, as chairman of committees, to exercise, and that his integrity is unimpeachable. We agree in this verdict. As chairman of the House of Lords committees, Lord Redesdale is a dictator of spotless honesty and purity, but prejudiced and pig-headed to an inconceivable degree. As he knows his business and likes it, and is always at his post, it is practically impossible to get up an opposition to his *fiats* on the third reading of a Bill. We do not, therefore, object to the man, we object to the system as it is described by Lord Clanricarde, who concurred in the report of the committee. He said: "In "the present case the Bill was referred to a committee of the "House of Lords. It was opposed by a great company, and "the parties interested were put to the expense of counsel, "witnesses, and so forth. When the Bill was opened, the "counsel for the great company withdrew all opposition, and "it, therefore, went straight to the chairman of committees "as an unopposed Bill. In his room the agent of the great "company proposed the insertion of a clause which was said "to be a usual one." At any rate, this "usual clause" was allowed by the sole judge, Lord Redesdale; and its effect was to deliver over entirely to the mercy of the London and North-Western, a railway on which about £200,000 had been expended, and with no remedy except another Act of Parliament. Lord Redesdale, as we know from his correspondence with the *Times*, approves of great companies and disapproves of little ones. He thinks it his duty to exercise a paternal care over the interests of shareholders in the great companies, and he, no doubt, decided according to his conscience. But we, with Lord Clanricarde, do most decidedly object "that, "in the case of an unopposed Bill, there should be no protec-"tion against the introduction of clauses fatal to its objects, "except the decision of Lord Redesdale, the chairman of "committees." Such a system cannot be considered satisfactory.

The Lords of the Treasury and the Custom-House have finally decided not to abolish the search of passengers baggage during the continuance of the Paris Exhibition, and as they were supported by two such authorities as the ex-Ministers, Mr. Gladstone and Mr. Childers, it must be presumed that they have reason on their side. A plan, which we have not seen anywhere—although it may not be new—has occurred to us, by which the time now occupied in waiting for a search might be very much abbreviated. The great mass of passengers will leave London and Paris by two or three trains daily. Let each Government provide the other with a custom-house room in each city. Let the baggage of all travellers—sent say two or four hours before the starting of the privileged trains—be searched, and then either sealed or placed under charge of a travelling officer, by whom the bulk would be delivered either in Paris or London, as the case might be; the extra expense to be borne by a small fee on each package. The result would be that passengers with a great deal of luggage would avail themselves of this escape from delay on arrival, and those travellers who did not, would have fewer competitors in the search-room at either end. A very small fee would defray all extra expense of this filtering arrangement.

A very hot dispute is going on in the *Times* between the representatives of the Great Northern Railway of France and the representatives of exhibitors who send their goods by the London railways, are assured they have left England, and do not receive them in Paris. We are very sorry for M. Petitt, the manager of the French railway. It is a rude shock to his feelings to be called over the coals because a few packages are missing or delayed. This is a sort of criticism they do not understand in France. French papers have no space at the disposal of dissatisfied correspondents. Every railway official partakes of the majesty of beings under the shadow of Govern-

ment patronage. Half the reputation of the French railways for good management arises from the circumstance that there are no public channels for complaining. If M. Petitt had, instead of peremptorily contradicting the correspondent of the *Times en bloc*, said, "What packages do you refer to?—when "were they handed to the railway, and where?—give us "names, dates, numbers, and marks," we might have had some faith in his denial, but we always doubt when a countryman of the author of "Candide" declares, in answer to a specific complaint, that "everything is for the best in the best "possible of empires!"

In spite of the opposition of all the parochial dignitaries, the Metropolitan Poor-Law Reform Bill is sliding easily through the House of Commons, proving in its course that the years of discussion on poor-law abuses have not been without their fruit. Mr. Villiers is very cross, of course, at seeing his natural enemies doing what, if he had not been unapproachable, he would have done himself, and so gained honour and credit. The classification of the sick is alone a great step in advance, and will prepare the way for further changes in the same direction until the time shall come that the able-bodied paupers can be mustered, and it will be possible to ascertain whether they are unfortunate, or simply idle and vagabonds by taste and nature. The making the pauper infirmaries medical schools will be a gain in every way—to the paupers, to medical science, and to the tax-paying public. Medical evidence will no longer be confined to ill-paid, much-suffering, easily-snubbed parish doctors.

Mr. Stuart Mill made a suggestion in the course of the debate, of an infinitely more mischievous character than any other of his more prominent legislative crotchets. It was that the parochial medical officers should be elected by competitive examinations. What is most wanted in a parish doctor professionally is medical experience—that experience which is only to be gained by large practice. There are other non-professional qualities which it is not necessary to enumerate. Amongst the best men who seek permanent appointments as parish doctors—we use intentionally a short familiar title which every one understands—are men of mature age, who have not, and never have had, the means to establish themselves in lucrative private practice, or who have not the appearance and the manners which have so much to do with success amongst paying patients; but they have been, from the time they were qualified to practice, attached to one or other great institution. But the secret of success in competitive examination is a great memory for books. Young gentlemen fresh from their studies, with lectures at their fingers ends, who could scarcely distinguish the premonitory symptons of scarlet fever from small-pox would gallop past a very sound, safe practitioner with all the arts for managing pauper practice. If it were proposed that law appointments should be awarded after competition, although quite impossible, it would not be theoretically absurd. A lawyer's knowledge can be tested by question and answer. An open competition for the next puisne judgeship, or even for a county court commissionership, would certainly be a fine sight, more amusing than the ordinary run of farces.

There are loud outcries in the vestries against the Metropolitan Traffic Bill, but it is probable that the opposition will have no serious effect on the meaning of the measure. The fault of the Bill was that its provisions were too peremptory. Strict rules were made, instead of placing in some central authority the power to make rules. The Government do not, perhaps, think Sir Richard Mayne quite the man; and they did not know who else to select. But serious amendments have been made by the Lords Committee. It is easy to object to any Bill, but some Bill we must have to clear the way, unless a process can be discovered for stretching the width of streets.

The Bill of the Corporation of London for obtaining powers to raise an improvement-rate has been thrown out without any words from opposing counsel. Thus it seems that, although the Corporation has great powers of resistance—great passive powers like the Pope—it has no expansive power. The Legislature will do nothing towards increasing the income of the one unreformed municipality.

Modern engineers have done much towards measuring natural forces. The force of atmospheric air and of gas have been calculated and reduced to rules, but they have not yet found any instrument for measuring the full extent of engineering folly. Mr. Arthur Sydney Ormsby, who "in the course "of his professional travels" has made observations of an engineering character on water supply in the United States, Central America, Australia, New Zealand, Mauritius, India, Egypt, Malta, Gibraltar, Belgium, Holland, and Prussia, has come to the conclusion that all our water engineers are quite wrong, and that it is to direct supplies of rain water that we should look for the supply of London. He proposes to construct at eight points around London artificial collecting grounds, or surfaces covered over with a light ornamental iron glass roof, so designed that all the water falling may immediately flow into a receiving reservoir, and pass from thence into a settling, filtering, storeage, and distributing reservoir, with which the main supply-pipes would be connected. He also proposes to lay down a separate set of iron-zinc mains, and to connect with them laterally a separate set of iron-zinc pipes, to supply an iron-zinc cistern, placed in the basement of each house. Each station to contain eventually an area of 500 acres, but in the first instance only 100 or 200 acres. The space beneath the roofs to be let to market fruit and flower gardeners, to form winter gardens, at from £50 to £200 per acre per annum! Comment would be wasted on a project in every respect so absurd; we only quote it as we should a project for a flying-machine service to supersede steam-packets.

Steam cultivation is making progress much more rapidly than the world outside British farmers imagines. On the authority of one of the secretaries to the Steam Cultivation Commissioners, appointed by the Royal Agricultural Society, we learn that some four hundred steam cultivators are now at work on farms embracing nearly 350,000 acres, including some 230,000 acres of arable land, on which they have displaced some 2500 horses, the value of whose food may be taken at £62,500 a year—a sum equal to feeding an additional 5000 bullocks, or about the supply of one metropolitan market. The reporter calculates that the saving to each employer of a steam cultivator is at least £100 a year, or, altogether, £40,000 a year. But the saving by the dismissal of animals which eat always for a machine which only eats when it is at work, is the least advantage of steam cultivation. The work, especially on stiff soils, is done at a depth and with a power and rapidity which no number of horses can effect.

The cabmen of London have been holding meetings to express their views on cab reform. These are by no means in a social or democratic direction. They desire to reduce the number of cab-drivers by making the licence payable at once for four years. They complain that at present any man who can raise a pound for a licence and £5 for a horse can hire a wretched cab during the summer months and compete with those who have more capital and more respectable equipages. According to this theory, we must be content with a smaller supply of cabs, if we want a better sort. But the most remarkable change approved by the cabmen's meeting is that relating to fares. Mr. Haden, connected somehow as engineer with Scotland Yard, has worked out a detailed scheme for measuring distances round London, founded on the same idea we ventilated in our "Notes" the other day. Taking a central point, the cabmen, with some show of reason, ask for the Post-Office in preference to Charing Cross; Mr. Haden proposes to measure the distances, mark them on lamp-posts, and have fares for each course or ride—so much to Highgate, so much to Kensington, and so on. This notion the cabmen adopt, but ask that the town fares or radius be reduced to three miles. It is not likely that they will get all their own way, but they will get a hearing; and if the lamp-post system be only partially adopted it will save some disputes.

Mr. Edwin Chadwick read a paper, the other day, at the Society of Arts, on the advantage of transferring the telegraphic system to the management of the Post-Office, with the conclusions of which we are, to our surprise, able to agree, while doubting or disputing most of his premises. It is the misfortune of Mr. Chadwick that he has acquired such a character for cooking evidence that few believe anything he asserts, even when he is in the right. In this instance he proposes that the Government shall buy the existing lines, paying for them in a special Telegraphic Stock to be created for the purpose. The reasons in favour of this proposal are purely practical, and supported by respectable evidence. There are three processes necessary in transmitting a telegraphic message: first, the sender must go to a telegraph-office; then the message must be sent along the wire; and thirdly, the message must be delivered by hand. The objections to the present system are that everywhere, except in London, tele-

graph stations are few and far between, and that even in London the means of delivery are very limited. Take the District Telegraph for instance; the means of delivery are so limited that a letter posted in Lombard Street for Kensington or Hampstead will usually be delivered an hour or two sooner than a message sent from Cannon Street. The ladies who work the suburban stations come late and go early. They have usually only one idle boy at their disposal, and so all the time gained in despatching a message is lost in delivering it. The same drawback affects messages sent into the country. Even on railroads there are many telegraphic stations which accept and deliver no private messages. Now there are, it seems, in the United Kingdom ten thousand post-offices, at every one of which a postmaster or mistress is resident night and day, and every one of which is or may be situated in the most convenient locality for the reception of letters and telegraphic messages. There are twenty thousand persons engaged in the collection and delivery of letters, who would all be available for the collection and delivery of telegrams, with such other additional assistance in messengers as the profits of the system might afford. The private telegraph companies have, according to Mr. Chadwick, less than two thousand stations, at each of which they must keep a person specially to work the apparatus, and at least one to deliver the messages, whose wages, added to rent and taxes, make a serious fixed charge on the gross receipts. Now the chief value of a telegram is that it may be sent after the post has gone, and quicker than the post. To take Mr. Chadwick's illustration, there is a telegraph station at Richmond, but at Kew, Mortlake, and Ham, although there are post-offices there are no telegraph stations; it would not pay to keep them up. A telegraph from London to Ham must be sent by wire to Richmond, and then, by a foot-messenger, three miles along the road, at a charge of 6d. a mile, and an hour of time, if the boy-official does not stay on the road to play at marbles or discuss the merits of the park donkeys. A message from London to Manchester costs 1s. 6d., and is delivered more quickly than one to Ham, which costs 2s. 6d. It is a matter of course that, if every collecting post-office were also a telegraph station, the person who delivers the letters could also deliver all telegrams which arrived before he went his rounds; and he could also collect, for transmission by wire, any telegrams delivered to him in his rounds. As these rounds are at the same hour every day, people who wanted to send a telegram from a remote rural district would always know where to find the postman on his rounds, and thus, by intercepting him, save a journey to the postal telegraphic house. As to the objection that there would be a difficulty in delivering messages from village post-offices, it is only one of degree: now, you cannot send a message at all. The fact that messages came, if only once a month, would create a supply of messengers. As a matter of course, the centralization of the management would diminish the working expenses. We might then look forward to a time when the telegraph stations would be open night and day by thousands—when every one would know where to send and where to ask for a telegram. We see no analogy between the claims to transfer railways and telegraphs to the Government. The one is a simple, straightforward, routine operation, for which the Government has all the working machinery in stations, post-masters, and messengers on foot, on horseback, and on wheels ready; the other demands a degree of administrative skill and an amount of responsibility which at any rate our Government does not possess. Of course we are taking it for granted that the telegraph companies are to be fairly paid for their property, in proportion to their present and probable profits. On the advantages to trade, and the comforts of social life, which an extension and cheapening of the telegraphic system would bring, it is not necessary to dwell; they are so obvious, that no one but a confirmed bore like Mr. Chadwick would have said anything about them.

An instance of the manner in which statistics may be abused was afforded the other day in a comparison of the fire-extinguishing capabilities of London, Paris, and New York. The writer gave the number of firemen in each city, and as there are more firemen in Paris than in London, and in New York than in Paris, he concluded that London stood the lowest of the three in fire-extinguishing power. But this argument is perfectly ridiculous. The firemen of New York are principally volunteers, and are associated rather for political and social purposes than for any practical purposes. They have the undoubted merit of having introduced steam-driven fire-engines; but, as a rule, they make a tremendous noise, fight with rival companies, and are of the least possible use—full of zeal and courage, with little discipline and no training. The firemen of Paris are soldiers—what we used to call Sappers and Miners, and at present Engineers. They take to extinguishing fires as part of their duty, and as a rule one trained fireman is worth a score of them. Fires are more easily kept under in Paris than in London, because the houses are built in a better manner, and of less inflammable material. For training and organization our Fire Brigade is far superior to any in the world, and more successful too; but the funds for its maintenance were limited when supplied by a few fire insurance offices only. Now that the Metropolitan Board has power to supplement the subscriptions of fire insurance companies by a rate, engine stations will be provided as required in every district of the metropolis. Much will be gained in moneyed means, something lost in the exchange of a small private committee for a Board that makes speeches and is reported in the newspapers. The members of the enlarged brigade are recruited almost entirely amongst sailors. Soldiers and policemen seldom make good firemen; they are too slow, too stiff, and too much accustomed to a buttoned up uniform. It is in St. Petersburg that fire-extinguishing operations are carried out with the greatest military show, and least effect. The late Emperor Nicholas made a point of being summoned to all fires. For this reason the officer in command always husbanded his extinguishing resources, even at the risk of allowing a burning house to embrace a whole street. On one occasion an English diplomatist of our acquaintance, being one of the first at a fire, asked the general officer and head fireman why he did not direct the engines to play vigorously on a certain spot, which would probably have made an end of the business. "Not so stupid," was the reply in French; "I should run the risk of having no water left "when the Emperor arrived."

A Food Committee has been sitting at the Society of Arts, and taking evidence, which, if sifted and translated into the vulgar tongue understood by ladies and cooks, may be made into really useful knowledge for village and other schools, where so much useless knowledge is elaborately taught. For instance, at the beginning of this month, Dr. Thudichum made a series of statements which upset many popular opinions on the subject of food. He was asked as to the nutritious value of Liebig's *Extractum Carnis*. The doctor said, "Ex-"tract of meat lacks the essential properties of nutriment." The body wants every twenty-four hours a given quantity of carbon, nitrogen, oxygen, hydrogen, phosphates, &c. Liebig's extract of meat contains these elements in very small quantities, and in an oxidized state. Therefore this "extract" would not nourish, and could not be called food. Extracts of meat, like tea and coffee, are simply stimulants. The extract is simply strong beef-tea; and if you were to dissolve a teaspoonful in a cup of water and drink it, you would not receive so much nutriment as you would derive from a single mouthful of meat. Beef-tea has an important effect upon the nerves of taste and digestion, but it is not nourishment. The extract of meat mixed with water should not be too strong. That is a mistake. Too strong a solution of extract of meat is as bad as too strong tea or coffee. Meat contains 75 per cent. of water, and 25 per cent. of solids. Of these 25 per cent., 15 to 18 are insoluble in water, 7 to 10 soluble in water, but of these, 4 become again insoluble by boiling; so that it is not far wrong to say that only from one-eighth to one-fifth of the whole of the solid constituents of meat pass into extract, or beef-tea. It seems that, after eggs, the nearest nourishment to meat is contained in Indian corn and various kinds of pulse and seeds *grown in southern climates*. Beans do not grow well in this country, "but form magnificent food "in southern climates." It is the advantage of meat that it supplies food in the smallest compass, and is dissolved early in the intestinal canal. Vegetable food requires more digestion. The house cat has gradually had its intestine lengthened to adapt it to the digestion of bread and potatoes. If sufficiently fed, vegetarians become big-bellied. Beans, lentils, and such food require careful preparation, if not they pass through the stomach undigested. The labouring people have neither the knowledge nor the means of cooking such food, therefore, practically, there is nothing like bread for them. It is soft, it gives no trouble, it is most easily digested, and no other grain food can enter into competition with it. To produce an equivalent to meat, add eggs to beef-tea, or boil

beans, peas, lentils, or millet. Boil them in soft water a sufficient length of time, add them to the *Extractum Carnis* at the end of boiling just before serving. Dr. Thudichum also said, "I have for a long time conceived the idea of preparing "a little book which might be called 'The Spirit of Cookery,' "and which should contain the elementary principles of cooking. "No good or economical cookery can be done on grates as at "present constructed." Bread and cheese is the cheapest and most nutritive food for a labouring man. Dr. Thudichum will set all teetotallers in a roar of indignation, for he maintains that alcohol is food. To prove it, he and his pathological class of thirty-two persons drank, at one sitting, forty-four bottles of Hungarian Burgundy and Sauterne, and analyzed the results! It is a great pity that some of the religious philanthropic tract-publishing societies do not add to their list some really plain pleasant treatises on the principles of roasting, boiling, frying, broiling, and stewing, such as the late Miss Acton or Mrs. Beeton could have written. We should like to see competitive examinations, with money prizes, at all schools subsidized by the State, where the questions should turn on the principles and practice of cooking, with such questions as—If you had to boil a piece of salt beef, weighing 12 lbs., with carrots, how should you proceed? What is the difference between boiling and stewing? How would you proceed to cook a chop? How do you make butter; and what precautions in winter and in summer? But very plain and really pleasant treatises are wanted for this purpose, and should be written by the best practical writers of the day, paid to put a great deal of information in a few pages. Such treatises are the proper subjects for tract societies, because they will not pay ordinary publishers.

THE COAL SUPPLY OF DIFFERENT COUNTRIES.

First Notice.

In the spring of 1865, Earl Russell addressed a circular to Her Majesty's Ministers abroad, requiring them to supply reliable information as to the extent of the production of coal, and of its importation or exportation in the different countries to which they were deputed; and the results of their inquiries on the subject were presented to Parliament in 1866 and in the present session, and have been issued in the form of two Blue-Books. It was required that the information should comprise:—

1st—A statement of the coal-fields actually worked, and of the development in production.

2nd—A statement of the external trade of each country in coal, whether import or export, showing whether the tendency is towards expansion or limitation, and whether it is the result of causes connected with the progress or otherwise in local manufactures.

And 3rdly—In cases where a country is dependent on foreign countries for its supplies of coal, the rates in which the supply is drawn from Great Britain and from other sources.

The reports forwarded in compliance with these instructions enter fully into the subject, and contain so much valuable information on the important question of the quantity of coal that is available for general consumption in most parts of the world, that we purpose giving in this and in subsequent numbers a comprehensive abstract of the whole. Commencing with Europe, we shall consider the various reports in alphabetical order.

Austria.—The first despatch from Lord Blomfield, dated June 29, 1865, states generally that the coal statistics of this empire have only been collected since 1855, and that geologists vaguely assert the carboniferous fields are of inexhaustible extent, but that the scarcity of railway communication has hitherto hindered the development of the production of coal, which has increased with the extension of railways. A report by Mr. Mouncey, and a further report by Mr. Bonar, in 1866, secretaries to the embassy, give some details, from which it appears that the total production of true coal in 1855 amounted to 1,140,000 tons, and was increased in 1864 to 2,400,000 tons; and that the produce of Tertiary or brown coal and lignite amounted at the same period to about 888,000 and 2 million tons respectively. The brown coal is stated to be found in all parts of Austria, and is of a sufficiently good quality to be generally employed for manufacturing purposes, and for railways and steam navigation, though the steamboats on the Adriatic used it mixed with two-thirds of British coal. The Bohemian brown coal of Teplitz is also used for making gas. The coal-fields of Fünfkirchen in Hungary are estimated to contain—counting a depth of 1800 feet only—a quantity of coal equal to at least 120 millions of English tons. The total annual produce of those mines in 1865 amounted to less than 200,000 tons. Bohemia and Moravia are the two districts from which the largest quantities of true coal are produced. The total imports of coal into Austria amounted in 1862 to about 320,000 tons, two-thirds of which were imported from Prussia, and not more than 25,000 tons from ports in the Adriatic, which probably came from England. The imports only slightly increased in 1863 and 1864, and the exports of coal, principally to Saxony, rather exceeded the imports. During the years from 1852 to 1863 the steam-driven machinery employed in Austria rose from 10,336 horse power to 57,586 horse power.

Baden.—In the Grand Duchy of Baden the coal produced is entirely anthracite, and is stated not to have amounted to more than 6000 tons in 1864, and yet less in the year following. English cannel (Boghead) is imported, exclusively for the manufacture of gas, to the amount, in 1865, of 450 tons; and it is observed that there is little doubt that in a few years the quantity will be greatly increased, "as the "advantages of private gas-works are becoming more and "more recognized."

Bavaria.—The two reports respecting the coal of Bavaria are diffuse and somewhat contradictory. According to Baron Liebig there is no real coal, answering to the term as used in England, produced in Bavaria, and it is said that the "Stein-"kolen," called in the later report of 1866 "stone-coal," is only a variety of brown coal. There were 163 mines in work in 1865 for the production of both kinds of coal, and 32,822 workmen were employed. The produce was 361,926 tons of stone-coal, of the value of £141,300, and 73,676 tons of brown coal, of the estimated value of £6744. There had been little variation in the production during the last three years; but ten years previously scarcely one-third the quantity was produced. By far the larger quantity of stone-coal is worked in the Palatinate, and brown coal is most abundant in the province of Upper Pfalz. An extraordinarily large vein of lignite is mentioned in that province, in the neighbourhood of Sanforst, varying in thickness from 10 to 30 feet. The data of the imports and exports of coal are very uncertain, but the former are considered to exceed the latter. Very small quantities of British coal find their way into Bavaria at present, and the price at Munich at which it is sold varies from 53s. 8d. to 90s. per ton.

Belgium.—Copious reports are given of the important coal-fields of Belgium. The coal-producing district of Belgium forms 1-22nd part of the whole superficial extent of the kingdom, and consists of a narrow belt which crosses from east to west. The western and most important follows the valley of the Sambre, through Hainault to Valenciennes and Douai, in France. The average breadth of this coal-basin is six miles from north to south, and at Charleroi it is nine miles across. The eastern basin follows the valley of the Meuse from Namur to Huy and Liege, running thence into Holland and Prussia. The total length of the former in Belgium is 95 miles, and of the latter 65 miles. Hainault—by far the most important of the coal-producing provinces—possesses coal of nearly every quality. It is generally divided into three districts—viz., the basin of Mons, of the Centre, of Charleroi. The Centre possesses coal-seams of great regularity, and the coal best fitted for domestic purposes. The pits of this basin are comparatively free from fire-damp. In the basin of Mons no less than 114 seams are actually worked. The best coal of this district—a rich flaming variety, much used in foundries and in gas-works—is obtained from the collieries of Fleure. Fifty-two seams of this coal are known, some of them of great thickness; but the pits are expensive to work, owing to the great quantity of water they contain. The average depth of the pits in this district is about 400 mètres, equal to 1312 feet. The basin of Charleroi produces more coal than the two other districts, but it is of inferior quality. The seams lie nearer to the surface than the former, the average depth of the mines being 200 mètres. In the province of Liege are the oldest collieries in the country. The coal consists of several varieties. The province of Namur produces a small coal only, and is of an inferior quality. The coal-pits in Belgium are usually provided with four shafts, one being for the extraction of the coal, a second for ventilation, the third for the use of the miners, and the fourth for

pumping out water, but that system is not universally adopted. The use of safety-lamps is made compulsory in all mines where fire-damp is known to exist, and the lamps are locked, so that no workman can remove the protecting cover. The Davy lamp has been generally supplanted by the Mueseler lamp, the invention of a Belgian engineer, which is found to be in many respects superior to the Davy, especially in giving more light and in being less liable to accident. The number of coal-mines in Belgium in 1865 was 287, and the amount of coal of all kinds obtained in that year 11,840,703 tons, the value of which is stated at 123,896,178 francs, equal to about £5,164,000. The number of hands employed in the Hainault coal-mines in 1865 was 62,461, and the amount of production 9,206,058 tons, the cost per ton being estimated at 9·41 francs. The price of the best coal produced in the province of Hainault was, in 1863, 22·31 francs per ton of 1000 kilogrammes, which is about 36 lbs. less than the English ton. It is stated that in the province of Liege, in 1865, there were, out of 65 mines, 21 working at a loss. The price of the best bituminous coal in that district was 17·98 francs per ton. The export coal trade of Belgium is confined principally to France, which country consumes nearly one-third of the whole produce of the mines. The exports to Holland, which in 1851 amounted to 230,753 tons, have been gradually diminishing, that country being now supplied principally with coal from Westphalia. The coal trade with France has also in recent years been diminished, English coal having to some extent supplied its place. Belgian coke is largely consumed in France, in consequence of its superior quality. The total exports of coal from Belgium in 1865 were 3,568,406 tons, and of coke 501,649 tons, of which quantities France took 3,348,693 tons of coal and 474,000 tons of coke. Belgium is also an importer of coal to a small extent, principally from France. From Great Britain, 74,686 tons were imported in 1857, but the quantity has been gradually diminished, and in 1863 it amounted to only 17,430 tons. A small quantity of coal is also imported from Russia. The French and English treaty of 1860 is stated to have been a great blow to the coal trade of Belgium, by relieving English coal from the prohibitory duties previously imposed on it. On comparing the home consumption of Belgium with that of Great Britain, it appears that the former is comparatively small even in proportion to its population. In 1859 the annual consumption of coal in the United Kingdom was about 2½ tons per head, and in Belgium not more than 1½ ton per head, and yet Belgium, it is observed, in proportion to its population, consumes far more coal than any other country on the Continent.

Denmark.—There are only two coal-mines in this country, both being in the island of Bornholm. The annual production does not exceed 7000 tons, all of which is consumed on the island. There is a considerable quantity of coal in Greenland, but it has not yet been worked. The imports of coal, almost exclusively derived from Great Britain, increased from 245,000 tons in 1860, to 306,000 tons in 1864. The extension of the consumption of coal is attributed partly to the increasing application of steam, and also to the circumstance that nearly all the trading towns in Denmark are now lighted with gas. The increasing use of coal for household purposes and for steam navigation is also alluded to as having caused the increase of imports. Denmark exports about one-seventh part of the quantity imported.

France.—The reports respecting the coal-fields of this country are very meagre. Sixty different coal-basins are named, with the production of each in 1863, the total amounting to 10,700,000 tons, of which more than one-half was raised from the mines of Valenciennes and Loire. The former yielded 2,947,000 tons, and the latter 2,813,000 tons. In 1864 the total production was 11,061,948 tons, and in 1865 it had increased to 11,297,052 tons; the coal-basin of Valenciennes having in the latter year yielded 3,360,000 tons, and the Loire 2,961,000. The proportions of the different kinds of coal produced were nearly as follows:—Anthracite, 81,400,000; tons, hard coal with short flame, 1,880,000; fat coal (*maréchal*), 465,000; fat coal with long flame, 5,840,000; thin coal with long flame, 2,220,000; and lignite, 243,000 tons. The imports of coal in 1865 amounted to 7,108,286 tons, and the exports to 335,126 tons, and of the former 1,455,206 tons were received from Great Britain; the duty payable on each ton being 11½d.

Greece.—The only coal found in Greece is lignite, which is said to abound in considerable quantities, but the attempts that were made by the Government to work it have been discontinued. For manufacturing purposes and for domestic use it is said that it might be profitably employed, and that it might be sold at the nearest port at 15s. per ton. English coal costs from 35s. to 45s. per ton. The importation is confined to British coal, of which about 64,800 tons were imported in 1864.

Hamburg and Northern Germany.—There are no coal-fields within the Hanseatic territories, nor anywhere in the northern parts of Germany. The coal-fields nearest to Hamburg are those of Westphalia, but by far the largest quantity of coal imported is obtained from Great Britain. In 1863 the total quantity imported was about 440 tons, of which 360 tons were supplied from this country. Though the demand for English coal at Hamburg is stated to be an increasing one, the Westphalian coals are coming into competition, and the Hamburg and New York Steam Navigation Company have begun to supply their steamers with Westphalian coal. The cost of Welsh coal on board at Hamburg is stated to be £1 3s. 3d. per ton; of German coal, about 19s.; and Newcastle coal, 18s. 10d. per ton.

Hanover.—Some coal is found in the mountainous districts of Hanover, but a large portion of the consumption is supplied by importation from England, Westphalia, and Ravensburg. The real coal formation exists only at Ilfeld and in the vicinity of Osnabrück. The produce of all the mines in 1863 amounted to only 322,000 tons. The seams of coal are thin, and the working of them is so costly that it is found cheaper to import, and the quantity produced has diminished since 1861. About one-half of the coal-mines belonged to the Government. The quantity of coal imported in 1862 amounted to 307,000 tons, equal to nearly half the produce of the mines, of which 111,400 tons came from England.

Electoral Hesse.—In the electorate of Hesse, in the year 1864, there were produced 308,150 tons of coal, of which 269,150 tons were consumed in the country, in addition to 26,500 tons of coke. Wood fuel continues to be extensively used.

Grand Duchies of Hesse and Nassau.—Wood-coal of several varieties is the only production of that fuel in these duchies, where wood vies with coal in cheapness. The total yield of coal in 1864 amounted to 51,000 tons, of which half was exported; and 75,000 tons of coal and coke were imported, including 5000 tons of coal for gas-works.

Italy.—There is no true coal in Italy, but lignite is abundant. Beds of it exist in Lombardy and Piedmont, in the Tuscan Maremma, and at several points along the Apennines, several mines are worked for the production of this kind of coal, but the total quantities raised are not specified. From some of the mines the annual production is said to be 6000 tons. The price at the pit's mouth for some qualities is stated to be 15 francs per ton, and the price at Leghorn was from 20 to 26 francs. The importations of coal into Genoa, the principal port for the coal trade, in 1864 amounted to 261,000 tons, and into Naples, in the same year, to 100,000 tons. By far the largest quantity was imported from Great Britain, but France, Austria, Sweden, and even the United States contributed some portions of the supply.

Netherlands.—There is only one coal-mine in Holland, situated near the Prussian frontier, and the quantity raised is insignificant, not amounting in the year 1864 to more than 18,000 tons, and of a very inferior description. The quantity imported in 1864 amounted to 1,358,000 tons, being an increase of 479 tons on the preceding year. Of that amount 921,000 tons were obtained from Prussia, 242,000 tons from Great Britain, and 179,000 tons from Belgium. The imports from this country were nearly stationary during the three years from 1862 to 1864, which is ascribed to the opening of the rich coal-fields of Westphalia. The coals exported in 1864 amounted to 48,840 tons, of which 25,000 tons were sent to Java, and 11,000 tons into Prussia. The coal used at the two gas manufactories in Amsterdam is derived from Prussia, and it is stated by the British consul in that city that Prussian coal is beginning to supersede English, even for domestic purposes, on account of its cheapness, though in quality it is inferior. At Grönigen, Harlögen, and Nieuwe Diep, the coal consumed at the gas manufactories is imported chiefly from England. The objection to the use of Prussian coal in steamboats is said to be that it fouls the chimneys, which require to be peculiarly constructed to prevent that annoyance.

PORTUGAL.—Some coal-mines are worked near Oporto, but the whole produce is consumed in that city. There are said to be coal-fields in other parts of the country; but the working of the mines is at present very imperfectly developed. The quantity imported annually is stated to be about 120,000 tons; derived entirely from Great Britain.

PRUSSIA.—The reports respecting the coal-fields and the coal produce of this kingdom are very diffuse, the information having been received from consuls in different parts, and in various forms. Westphalia is the most important coal district in Prussia, and the produce has attained such importance that it is said to compete not only with the coal of Belgium, but with that of England, and is extending yearly. As in Belgium and Austria, the lignite, or brown coal, is also abundant in Prussia, and is much used, though its heating power is not equal to that of stone-coal. A commercial report by Mr. Lowther, the secretary of the embassy, dated July, 1866, gives the fullest and most general account of the production of coal in Prussia. He states that the coal-pits of greatest importance are in the Rhenish Provinces and Westphalia, in the western parts of the kingdom, and in the province of Silesia. In addition to fossil coal, brown coal, it is observed, appears in layers near the surface in numerous great and small troughs, diffused not only over those provinces, but also in others, particularly Saxony and Brandenburg. The three coal-basins particularly named as being of great extent are those of Upper Silesia, of the Ruhr, and of the Saar. Other coal-basins exist in Lower Silesia, in the Rhenish Province, and in North Westphalia, which are of less importance. The most important seams of brown (Bovey) coal are in the eastern part of the country. The coal-pits of the river Ruhr extend over 46 miles in length on the Lower Rhine, and in Westphalia. That district supplies nearly half the coal produce of the kingdom. It has been ascertained that there are 65 seams of coal worth working, the united thickness of which amounts to 210 feet of pure coal, and it has been calculated that at the rate of the present annual produce it will last for more than 5000 years. The Upper Silesian coal-fields yield not quite one-fourth of the whole produce of the kingdom, but the thickness of the accessible coal-seams—not taking into account those less than 30 inches—are estimated to be 350 feet, and at the present rate of demand are considered inexhaustible. A sixth part of the coal produce is derived from coal-pits of the river Saar, and the total thickness of the various seams of coal is said to be 380 feet. It is estimated that this coal-field would last for 3000 years at the present rate of extraction. The total annual produce of coal and brown coal in Prussia had increased from 2,901,713 tons, in 1841, to 8,571,070, in 1856; to 16,903,520, in 1862; and the production in 1864 amounted to 21,197,266 tons; of which quantity 4,649,527 tons consisted of brown coal. Though Prussia exported coal from several provinces, to the amount, in 1862, of 3,000,000 tons, those parts bordering on the Baltic could be supplied cheaper from England, and in 1862, 705,590 tons were imported from this country, principally for gas-making. It is observed that the Baltic ports will aways offer secure markets for British coal on account of the great distance of the inland coal-pits. It is remarked, however, in Lord Napier's despatch to Earl Russell, dated June 19, 1865, "Although the importation of "English coal is still on the increase, the most notable feature "in these reports is the rapid development of production in the "coal-fields of the Rhine Provinces, which is not only sufficient "for local consumption, but is exported to Holland, and is gra-"dually finding its way to Eastern and Northern Prussia, where, "as it is alleged, it will eventually displace English coal." The average price of coal at the pits in 1861 is stated to have been 5s. 7¾d. per ton, and of Bovey coal 2s. 9¼d.

(To be continued.)

Circular to Gas Companies.

THE Bill for the amendment of the Metropolis Gas Act had not been issued at the time of our going to press. The delay may probably have been caused by the appointment of the Duke of Richmond to the office of President of the Board of Trade in the place of Sir Stafford Northcote, but the commendable care which the subordinate officials of the department are taking to make themselves fully acquainted with the whole question before committing the Government to a measure on which they can take their stand will more probably account for it. An absurd report was current that it was intended to have a sliding scale of prices, commencing with 10-candle gas, and rising candle by candle to 20 candles; but if any notion of the kind were entertained it has been abandoned, and it is understood that a minimum illuminating power of 14 candles will be adopted. The gas companies have in the meantime addressed two letters to the Board of Trade, containing very able replies to the letter of the Corporation dated February 16, and to the "reasons" given by the Metropolitan Board of Works in support of their recommendations for the supply of 18-candle gas at 3s. 6d. per 1000 feet, and for the compulsory purchase of the works of the gas companies at the rate of 6 per cent. In the observations of the gas companies on the letter of the Corporation they do not fail to comment on the assumed spirit of fairness professed, and on their protestations against recommending a breach of faith, at the same time that they propose to compel the companies to sell their property for 40 per cent. less than it is worth. The attempt to invalidate the estimates of the engineers and the calculation of the companies is severely commented on, and the errors made by the Corporation are clearly pointed out. The companies observe that they "can-"not refrain from exposing the manner in which those who "seek to impress the Government with their own infallibility "have brought out the item of £336,000 of profit which is to "provide for future dividends." That item consists of gas unaccounted for, which the Corporation insist ought not to be wasted, and they charge it, not at the cost price, but at the highest price which they represent to be charged by the companies. But if the loss of gas in distribution could be prevented as the Corporation pretend, that quantity of gas would not be made, and the sale of it could not, therefore, be reckoned as part of the revenue. The companies proceed to point out paragraph by paragraph the various misstatements in the letter of the Corporation, and conclude by stating their objections to the amendments proposed by the Corporation to be made in the Metropolis Gas Act. With regard to the compulsory purchase of their works, it is observed that such a proposal has for its object the cutting down of their capital, all of which has been legally raised and expended, and that such a course cannot be adopted without actual confiscation of the shareholders property. There is appended to these observations a second report from the five engineers, in which it is stated that on a careful reconsideration of the subject, they unhesitatingly adhere to their estimate. In reference to the quantity of gas unaccounted for, they observe that the Corporation have fallen into the great error of supposing that the difference between the quantity of gas made and the quantity sold is caused by leakage, whereas a much larger proportion of the unaccounted-for gas is lost by condensation, fraudulent burning, excess in consumption by the street-lamps beyond the contract quantity, and deficient registration of meters. The engineers certify, in conclusion, that 14 or 15 per cent. of the gas made is a very moderate loss.

In the observations of the metropolis gas companies on the "reasons" of the Metropolitan Board of Works, they enter fully into the circumstances which led to their present position, and completely refute the oft-repeated assertion, that the Metropolis Gas Act of 1860 conferred all the advantages of an "unrestricted monopoly" on the gas companies without being of any benefit to the gas consumers. It is clearly shown that all, and more than all, the advantages which the companies now enjoy, were possessed by them before the passing of the Metropolis Gas Act, which was simply a controlling Act, regulating their powers. It is pointed out that the districting arrangements were made by the companies themselves, some years before the passing of that Act, to put an end to the evils which had resulted alike to the public and to the gas companies from competition. All that the Act did for them was "to sanction the state of things which had manifestly "conduced to the benefit of all parties, as was proved by the "companies opponents in 1860," and it did not confer a single privilege on them of any description. The controlling powers of the Act on the several companies are distinctly set forth, and may be thus enumerated. The Act restricts all the companies to one uniform price. It limits their dividends to 10 per cent., six only of the thirteen companies having previously been so restricted; and the making up of back dividends to that amount—which the Gas-Works Clauses Act made indefinite—was restricted to six years. All the companies were subjected to one uniform standard of illuminating power, which was generally two candles higher than any previous standard in the

metropolis. The companies were placed under stringent regulations as to the purity of the gas they supplied, to which none of them had been previously subjected. They were compelled to establish testing-places, and apparatus for testing the quality of the gas, and were rendered liable to penalties if it were found to be below the prescribed standards of purity and illuminating power. They were for the first time compelled to furnish a supply of gas within their respective districts to all who might require it, and to keep the mains constantly charged both night and day. The Act compelled them to supply meters at certain fixed rates, and to lay down service-pipes to the extent of 150 feet when required, at their own expense. The requirements of the Act for the publication of annual accounts, and the power given to the Home Secretary to enforce its provisions, are also mentioned, as concluding refutations of the statement of the Metropolitan Board of Works that the Act of 1860 conferred on the gas companies "unrestricted monopoly."

The other "reasons" are answered equally satisfactorily, paragraph by paragraph, but they scarcely deserved the elaborate contradictions that they have received. It is stated, as showing the fallacy of the assertion that the gas consumers have derived no benefit from the Metropolis Gas Act, that the reductions made from time to time in the price of gas since the passing of that Act have resulted in a saving to the public of more than half a million sterling. With respect to the allegation that the 6 per cent. bonds of the Metropolitan Board of Works would be equivalent to the 10 per cent. dividends of the gas companies, in consequence of the "hazardous security" of the latter property, it is well observed that if it is intended to convey that the shareholders parliamentary rights can be interfered with by new legislation, the same might be said of their rights if they accepted the bonds of the Metropolitan Board instead of their shares. An appendix to the observations of the metropolitan gas companies gives the market value of the shares of gas companies in the provinces that are paying 10 per cent. dividends, for the purpose of showing that the security of gas property is not generally considered of the hazardous character represented by the Metropolitan Board of Works.

The suburban gas companies have taken alarm at the rumour that they are to be brought under the operation of the proposed Metropolis Act Amendment Bill, and the Crystal Palace District Company have taken the lead in protesting against any disturbance of the settlement effected in 1860, by which they were excluded from the Act then passed.

In the agitation of gas matters in London, Mr. Flintoff has come to the surface, and is lecturing in various parts of the metropolis on the misdeeds of the gas companies. It seems a strange neglect of extraordinary merit that a man who has, by his own account, reduced the price of gas in 204 cities and towns in Great Britain and Ireland, and saved the public more than £800,000 a year, should be lecturing for hire up and down the kingdom. A grateful public ought to have pensioned him off long ago. He made his appearance at Exeter Hall on Thursday last, where he repeated the old story about the cheapness with which gas may be manufactured, and he now attempts to secure a reduction in the price from 4s. to 2s. 9d. per 1000 feet, and a repeal of the Metropolis Gas Act. He also combines in his present movement opposition to the Metropolitan Improvement-Rate Bill now before Parliament. At Exeter Hall, though the admission was free, the attendance was very scanty, and his stentorian voice resounded through nearly empty space. Mr. Flintoff has also been recently enlightening a public meeting at Newbury on the subject of gas supply, and the good people of that town listened with wonder to his astonishing revelations how gas can be made and sold for 1s. 5d. per 1000 feet, and of course they were anxious to get a supply of good gas on such terms. But considering that the conditions on which Mr. Flintoff has offered nearly equal advantages to many other towns in the kingdom have been accepted by only one or two, and in those cases with disastrous results, the gas consumers of Newbury will do well to pause before they follow such a guide. He has had the success, however, of making the *Andover Advertiser* a convert to his views, and the readers of that paper were recently favoured with a "leader" on gas, in which that public instructor informed them that the value of the residual products of one ton of coal, after making 7000 cubic feet of gas, amounts to three times the cost of the material employed, and that consequently gas might be supplied at a large profit for 2s. per 1000 feet, instead of at 6s., the present price. This public instructor professes to base his statements on the estimates of Mr. Flintoff, of the correctness of which he thinks there can be no doubt; but we never heard even that "distinguished gas engineer" indulge in such monstrous exaggerations, and if he did so it must have been in reliance on the utter ignorance of Berkshire farmers about the manufacture of gas.

At the present time, when there is a movement for taking the management of the supply of gas from the existing companies and placing it in the hands of local authorities, it may be of some use to point out instances of the manner in which gas affairs are mismanaged when so conducted. The Middleton and Tonge Commissioners have had the management of the supply of gas in that district for twenty years, during which time not the slightest attempt to improve the process of manufacture has been introduced, the object of the commissioners being apparently confined to the reduction of expenditure to the lowest possible scale, so as to curry favour with the ratepayers. About 18 months since a new gasholder was ordered, to supply the place of one that was leaking from every seam; but the expenditure of so much money was discountenanced, and the most enlightened members of the Gas Committee were turned out of office at the next election. A similar miserable practice of economy we understand pervades all their arrangements, of which an instance was given at the last meeting of the Board, in which this JOURNAL was concerned. The item of 18s. paid yearly for the JOURNAL OF GAS LIGHTING was objected to, because it was considered that the manager ought to be sufficiently acquainted with his duties not to require the assistance of any publication on gas, and on that ground it was countermanded. This instance of cheese-paring economy is worth notice, as indicating the manner in which the commissioners in small towns ignore all probable improvements, and the expulsion of the most intelligent members of the Gas Committee at Middleton for having ordered a new gasholder shows that those of the commissioners who are inclined to make any improvements are obliged to give way when popularity is to be gained by an apparent saving of the pockets of the ratepayers.

The concocting of joint-stock companies continues to be a thriving trade in spite of panics and of the lessons taught by Chancery Courts. In no department are the traps laid for the unwary more artfully concealed, nor the victims more securely entrapped, than in the getting up of little companies for lighting with gas the few remaining small towns and villages that do not possess that advantage. The operation is very simple. The agent or traveller of a contractor, calling himself an engineer, visits such a town, and introduces himself to a few of the most respectable inhabitants, pointing out the advantage it would be to have the place lighted with gas; and, producing Articles of Association, he contrives to obtain the signatures of a few persons as shareholders of the proposed company. From that day the fish is hooked. We have before us extracts from the Articles of Association of a company thus formed, which provide that "Mr. A. B., of ——, shall be the engineer of the "company, and that he shall be paid by the company the "usual commission of 5 per cent. on the outlay expended on "the company's works, and the further sum of 3 per cent. for "travelling and incidental expenses. And in case the said "works shall not be commenced for twelve calendar months "from the date of these articles, he shall, in lieu of the same "sums, be paid a sum of money equal to 3 per cent. on the "capital of the company, in discharge of any claim of his for "disbursements and expenses subsequent to the date of these "articles, and the same shall be recoverable as liquidated "damages." The Articles of Association give full powers to the directors for the appointment and discharge of all the officers of the company, *except the engineer*. The farce of advertising for tenders for the work may be subsequently gone through, but contractors are generally quite aware whose agent Mr. A. B. is, and are too much men of business to waste their time by sending in tenders. Under such circumstances, the real principal in the matter becomes the contractor without competition, on his own terms. It may seem strange that any men should be so unwary as to sign Articles of Association which place them so much in the power of the engineer; but the advantages of the scheme are so temptingly set forth, and the prospect of success seems so certain, that parties are induced to sign without due consideration. We believe the safest course to pursue under such circumstances is to allow the company so formed to be dissolved, and, after having paid off the claims of the engineer thus forced upon them, to register

an independent company under another title, and to proceed with the work free from the trammels of such an impolitic agreement.

A case of considerable importance to the metropolitan gas companies came before the Guildhall Police Court on Friday. The Great Central Company were summoned for not having supplied gas to a refreshment-room keeper in Basinghall Street after having been required so to do. On the behalf of the company it was alleged that the complainant had failed to give the gas company security for the payment of the gas supplied to him; but it did not appear that the application for security had been given in writing, as provided by the 15th section of the Act. The magistrate, therefore, fined the company £5, and £2 2s. costs. Notice of appeal was given by the company against this decision.

On the dissolution of any public company, or its amalgamation with another body, the condition of the clerks thus thrown out of employment is always a melancholy consideration. The sale of the works of the United General Gaslight Company to the Alliance Company of Dublin has given rise to circumstances of this character. The Alliance Company liberally awarded the sum of £4000 as compensation for those officers whose services they did not retain, and at the half-yearly meeting of the United General Company, on the 5th inst., the compensation of their officers formed the principal subject of discussion. A letter from Mr. Galbraith, in another column, represents the grievances of himself and another brother officer, who, having accepted an appointment in the Alliance Company at a reduced salary, expected to come in for some share of compensation. It appears, indeed, that they had been induced to withdraw their opposition to the Bill when before Parliament on some promise of the kind, and they seemed, therefore, on that ground, entitled to more consideration than they have received from the shareholders. It is also remarked, that while the Alliance Company granted £4000 to compensate the officers of the United General Company, the latter have only contributed £500 for that object, and, though the directors are placed in difficult circumstances, the shareholders could scarcely have objected to a more liberal compensation.

In consequence of rumours of intended interference with the supply of gas in Dublin by the Fenian madmen, the gas-works have been garrisoned by a strong force of the admirable body of constabulary to whom Ireland is so much indebted for the order and tranquillity which has been maintained under the late trying circumstances. It is a novel feature in the history of gas lighting to have armed bodies of men stationed within the works to protect the gasholders.

An unforeseen objection to the plan of subways for laying gas and water pipes has presented itself at Madrid. It appears that housebreakers there take advantage of access to the houses which may be obtained through the sewers to carry on their operations in that direction, and it has been found requisite to organize an underground police force for the prevention of burglaries—a provision certainly not contemplated by the Metropolitan Board of Works in the extension of their subway scheme.

Dr. Frankland is delivering a course of six lectures at the Royal Institution, on "Coal Gas," reports of two of which we publish in another column. There is, perhaps, no living chemist who has so profoundly investigated the subject, nor one to whom the profession will bow with greater respect, even though the results of his researches tend to upset previously received theories. One of the theories hitherto considered as established is, that the luminosity of a gas-flame depends on the incandescence of the solid particles of carbon it contains; but Dr. Frankland's experiments seem to throw doubt on the cause of the phenomenon, and to the consideration of these point his two first lectures were principally directed.

An explosion took place in the purifying-house of the Rochdale Road station of the Manchester Corporation Gas-Works, on Sunday, the 10th inst., which caused considerable damage to the works, but was fortunately not attended with any loss of life. It appears to have been caused by some derangement of the hydraulic valve, by which the current of gas is changed from one purifier to another; but the exact nature of the derangement has not been stated. The accident points to the necessity of having all such valves covered, or, what would be better still, the employment of Messrs. E. Cockey and Son's admirably contrived but simple valve, by which such derangements become impossible.

A Bill has been introduced by the Government, which is now passing through the Commons, for the abolition of certain exemptions from local dues on shipping, and on goods carried in ships, which may prejudicially affect gas companies in seaports, who land their coals at their own or private wharves, and companies so situated should lose no time in concerting measures for their protection.

Correspondence.

UNITED GENERAL GAS COMPANY AND THEIR LATE OFFICERS.

SIR,—As my name was rather prominently brought forward by the chairman at the half-yearly meeting of the above company, on Tuesday last, at the London Tavern, will you kindly allow me, through the medium of your valuable journal, to say a few words in reply. I am the *senior* officer of the company, having spent nearly forty years in its service. It is true that I have obtained a situation in the amalgamated company; but the change in my position, from one company to another, involves a loss to me of about £100 per annum. Surely, under such circumstances, it was not *unreasonable* in me to expect some compensation from the directors of a company with whom I had been *so long* associated, and whose interests, as will be fully admitted, I have at all times endeavoured to promote to the utmost of my power. When their bill was passing through Parliament, I sought with another brother officer, Mr. Overend, to get a clause inserted securing us compensation; but from a communication received from the company's parliamentary agent, Mr. Coates, stating that if we persevered in so doing we would be placing ourselves in a "*hostile*" position to the directors, and suggesting to us whether it would not be *wiser*, on our part, to throw ourselves on the generosity of the directory? Having confidence in the directors, in an evil hour we withdrew our opposition; but, we regret to say, our confidence has been misplaced, as from the circumstance of our having obtained employment in the new company, though in both cases at a great pecuniary sacrifice, we have put ourselves "out of court," as the chairman expressed it, and are therefore not entitled to any remuneration. Having now attained, as may well be supposed from my long servitude, to the "sear and yellow leaf," and while the shadows of the evening of life are drawing around me, with increasing physical debility, which will oblige me at no distant period to relinquish my present onerous duties, and having no claim upon my present employers, in whose service I may now be regarded as a junior officer, I have the gloomy prospect of my old age being embittered by privation and penury. Had the directors read our appeal *addressed to the shareholders*, at that meeting, for whom it was intended, we are persuaded we would have had the sympathy of the proprietors then present, and the result would have been different; but it was suppressed. I am sure that many of those gentlemen held the enlightened views of Mr. Lysley, at the previous meeting, as reported in your last number, when he remarked:—"When a gentleman goes into an establishment of this kind, never foreseeing that it will be bought up by another company, he naturally looks upon it as a permanent provision, probably for life; and as this has been entirely altered, I hope the claims of those gentlemen will be considered fairly and favourably." This is my case. I hope, however, as I see that the directors have reconsidered the case of one deserving officer, and given him an *additional* grant of £300, that they will also kindly *reconsider* our case, and even now at the eleventh hour remember their old and faithful officers who have spent the prime of their lives in their service. I pronounce no opinion upon the amounts already allocated to the several officers not employed by the amalgamated company, as to their being distributed partially or otherwise, though, of course, I have my opinion on the subject; but I do say that when the Alliance Gas Company generously contributed £4000 towards compensating the officers of the United Company, the directors of that company should have supplemented their grant with a larger sum than £500.

WILLIAM GALBRAITH.

20, *Clarinda Park, Kingstown,*
March 12, 1867.

Register of New Patents.

2067.—JOHN ISRAEL ENSLEY, of the city of New York, in the state of New York, U.S.A., for "*An improved apparatus for manufacturing illuminating gas, and producing bone-black and other valuable residuum.*" Provisional protection only obtained. Dated Aug. 11, 1866.

The object of this invention is to separate the gaseous and solid constituents of various substances, retaining the gaseous matter in suitable apparatus to be utilized, and producing bone-black or other valuable residuum from the same. A retort is provided, having a fire-chamber and smoke-pipe, as usual. Within this retort a chamber is situated, the said chamber being closed, except at its outer end. A set of cylinders is constructed, any one of which fits the chamber in the retort, and is made open at one end to receive the charge to be subjected to heat. The said cylinders are provided with perfora-

cut off the gas three or four months before, but Mr. Gandon said the Pasha was doing all he could to get the money, so that we went on hoping against hope. We did cut the gas off at last, but that step did not lead to the bringing forth of much money, and there is still a sum of £2000 owing to us. The gentleman there to whom I had an introduction, through a private friend, wrote me to say that we did wrong in cutting off the gas at all, and that it was a mistake on our part. Perhaps, however, he did not understand Orientals so well as the gentlemen of this committee. "It is reported by the manager at Smyrna, that it has been discovered recently that the rate assessed for the public lights by the Emlak Commission, will not, when collected, come up to the agreed price per lamp by about 10 per cent. Moreover, he states that 10 per cent. will have to be deducted for bad debts, and 10 per cent. for expenses of collection, and that the public lighting will yield little or no profit." What that means is this: The Emlak Commission assessed the tax upon so much frontage for each house, but when they came to go into the particulars it was found that the amount assessed, according to their mode of calculation, did not come up to the £2000 they owed us, but only to about £1800. But that had nothing to do with us—it was their mistake. Then they wanted a reduction, and we said we should be glad to offer them a handsome commission to send the money over to this country. "It is unfortunate that the company's funds should have been spent in too lavish a manner, and, consequently, that the interest on a round sum raised in addition to the capital should have to be provided for. We do not think the opening at Smyrna so good as represented in the prospectus and reports, but still probably sufficient business could be done to yield a fair dividend on the original capital." Well, we hope so too. "Though we cannot hold out to the shareholders any hope of their receiving a moderate dividend for some time to come, still we think that good management may yet go far to atone for past errors of judgment." As I said before, for gentlemen, who really do not know a stoke-hole from a retort, to talk to us in this way about the management of the works is a great piece of presumption. I can say no more. "Turning from the past to the future, we have to state that, in our opinion, rigid economy, and a severe supervision of the expenditure, will be necessary to place the company in a sound position." But do they point out a single item in which that "rigid economy" has not been observed? Do they point to a single expense, except that incurred for wages, which I have already shown was properly incurred, to which even they can take objection? "In reference to the directors, we would recommend that their number be reduced to five, that no fees be received by them till a dividend out of profits of at least 3 per cent. has been paid to the shareholders, that they forego the sum of £700 (unpaid fees) for which they are entered as creditors on the books of the company, and that when they do receive fees, as per paragraph 2, the sum per annum do not exceed £550 (being at the rate of £100 each for four directors and £150 for the chairman)." A very cool recommendation, I admit, that we are to do your work, and advance money to keep your affairs going, and then to be abused and receive no pay. But we have complied with the recommendation, as, during the last year and a half, we have not received one penny. With respect to the reduction of the directors to five, one of our number is unfortunately dead, and I offered my resignation this time last year, and it was only at the earnest request of the shareholders then present that I consented to remain on the board. I felt that a great many friends had come into the concern because of my name, and, unfortunately, without asking me, for I never recommended any one to join it, and therefore I was anxious to do all I could to get the company out of its difficulties. But it is no honour to me to be chairman of a small company like this; there is neither honour nor credit to be got out of it, and certainly no profit, so that I can have no wish to retain my seat to be badgered here half year after half year about our bad management, without their being the slightest foundation for it. My seat is, therefore, at your service. If we are to sit here and do your work, and find money for the undertaking, I think we have a right to ask that we may be saved from such reflections as are contained in this report. "We think that the company should be represented at Smyrna by a resident director, if possible (in addition to the manager of the works). Failing this, three or four leading merchants or brokers might be induced to act as a board of supervision, to assist the manager with advice, to take a kindly interest in the affairs of the company, and to strengthen its position on the spot." Nobody has the slightest objection to that. We have written to several parties to ask them to represent us, but it is not every person who can do it; it must be a person who understands the course of English business as well as the affairs of Smyrna, and you will recollect we have no shareholders there. Then they say: "The gas manufacture should be closely watched. If the carbonization be good and the leakage small, money will be saved that up to the present time has been lost." Certainly a very wonderful discovery to make, only one would suppose they were talking to children in making such a statement. They then say that the European quarter of Smyrna should be thoroughly worked and lighted up before operations are extended to outside places. I think this statement is made because among the correspondence they found a letter from Mr. Gandon saying he had had an application to light up one of the suburbs, in which the merchants reside, about four miles from Smyrna. Of course if we could have got the lighting it would be a good thing, but we found that we could not get the persons residing there to bind themselves to take the light if we laid down the mains, and so we gave it up. Then they tell us that no new concession should attract our attention, that the assessment for the public lamps must be revised, and that touching the dispute with the authorities, the matter ought to be taken out of the hands of Mr. Gandon. Gentlemen, I must leave the question in your hands. I can only repeat my opinion that this report, intended to injure the directors, can have had no effect except to injure the position of the company. Who will come forward and buy shares or lend money upon debentures with such a report before them? We know the untruth of it, but the outside world does not. As far as the board is concerned, it has passed harmlessly over our heads; but as far as the company is concerned, it is a most unfortunate document.

Mr. HORNER (deputy-chairman) seconded the adoption of the directors report.

Mr. WINSOR, a member of the committee, said the chairman was quite mistaken in supposing there was the slightest *animus* against the directors. There was one unfortunate thing about the appointment of the committee—viz., that the resolution appointing them was written afterwards. He agreed to serve upon a committee of investigation, and was quite surprised afterwards to learn the terms of the resolution. This report was not drawn up against the directors, and he thought the chairman in his remarks had been very hard upon the committee. There was one great fallacy in the calculations upon which the works of the company were founded, and that was with reference to the population of Smyrna. It was said that works were required to supply a city with a population of 180,000. From all he heard he had reason to believe that a very large proportion of the population would never require gas. The committee had nothing to say against Mr. Gandon, and did not ask that he should be superseded, but that some one should be sent to his assistance so as to get the company out of the present dead-lock. As to the reports of the company being too highly coloured, if he had half an hour to do it in he could show the truth of that statement. The committee had drawn up their report most carefully, and to the best of their ability, and he did not think the remarks of the chairman at all met the statements it contained.

Mr. KNIGHT said he happened to be that member of the committee of whom it was said at the end of the report that he had been unable to attend more than the first two meetings. He believed the proceedings of the committee were not dictated by any desire to benefit the company, and that the only effect of these proceedings was to damage the undertaking in the estimation of the public. When he attended their first meeting he fully expected that Mr. Oxenham, who moved for its appointment, would be prepared to point out some definite course to be adopted. He found, however, that that gentleman was quite at sea, without a compass or a rudder, and as he believed no good could result from the deliberations of the committee, he determined, after the second meeting, to have nothing more to do with it. The speaker commented at some length, and amidst considerable interruption, upon the course of action taken by the committee, and concluded by expressing a hope that an end would now be put to an agitation which was so groundless and so prejudicial to the interests of the shareholders. They were bound to do all in their power to strengthen, and not to weaken the hands of the directors. He believed that if they turned a deaf ear to such rumours as had been circulated, and endeavoured to work harmoniously together, the ultimate success of the company would not be much below their original anticipations.

The motion for the adoption of the report of the directors was then put and carried.

The Hon. H. BROWNE, announced his intention of resigning his seat at the board, not, as he said, from any want of confidence in the concern, but because he had no time to attend to the duties of a director. Before, however, he took that step, he wished to propose a resolution for the adoption of the meeting, concurring as he did in the remarks made by the chairman as to the damaging effect of the agitation which had been got up against the board, and more especialty of the circulation of such a report as had been drawn up by the committee upon utterly insufficient data, and published by them to the world through the columes of the *Times*. The resolution was in these terms—"That in the opinion of this meeting the report of the committee of shareholders which has been circulated among the proprietors is based on wrong data, and is calculated to injure the general interests of the company, and to throw discredit upon the undertaking."

Dr. FRANCIS seconded the resolution.

Mr. COLE, as a member of the committee, said he had no doubt if they all worked harmoniously they would get on better, and he hoped their proceedings in future would be more satisfactory. He thought the policy of the directors in the past had been vacillating, and that the company were not properly represented at Smyrna.

The CHAIRMAN defended the board against the charge of vacillation, and said, as far as the better representation of the company was concerned, the directors were as anxious for it as any one could be, but the difficulty was—Who was to undertake it?

Mr. OXENHAM said, when he entered the company he certainly found that he had been misled as to its prospects, and therefore he felt it his duty to adopt the course he had pursued. He had no animosity towards the directors, and deeply regretted that the chairman had spoken of the proceedings of the committee in the way he had done.

Mr. LEMON said he had no sympathy with many of the statements in the report, but he objected to the term "wrong data" in the resolution, as that would be impugning the correctness of their own books. He should move, as an amendment—"That the report of the committee be received," and there left.

Mr. WINSOR thought that in the interests of the company the chairman might second the reception of the report. He hoped the directors would accept it in a kind and friendly spirit.

The CHAIRMAN said he might be very weak, but he was not going to write himself down an ass.

Mr. HORNER did not hesitate to say that for any one to get up and ask a member of the board to second the reception of the report was the most insolent thing he had ever heard in his life.

The Hon. H. BROWNE said to meet the view of Mr. Lemon he would alter the word "data" in his resolution to "inferences."

Mr. HORNER severely condemned the publication of the report of the committee in the public newspapers, and hoped the shareholders at large would never endorse the statements by voting for its reception.

The amendment was not seconded, and on the motion of the Hon. H. Browne being put to the vote it was carried, with two dissentients.

Dr. Fraser, the retiring director, and Messrs. Rowsell and Allin, the retiring auditors, were severally re-elected, and the remuneration of the latter was fixed at ten guineas each per annum.

On the motion of Mr. KNIGHT, seconded by Mr. COLES, a vote of thanks to the chairman and directors was adopted.

The CHAIRMAN acknowledged the vote, and thanked the proprietors generally for the confidence reposed in the board. He believed they had done their duty to the utmost of their ability in the past, and he had only to assure the meeting that no effort would be wanting on their part in the future, to advance the interests of the undertaking.

THE WATER SUPPLY QUESTION AT CANTERBURY.

On Thursday evening last the General Purposes Committee of the Town Council for carrying out the provisions of the Local Government Act met to consider an offer made by the Canterbury Gas and Water Company to sell to the local board the plant and rights of the water supply for the sum of £7000. The meeting was under the presidency of the MAYOR, and as the subject is one of great importance, there was a full attendance of members of the council.

The TOWN CLERK having read the offer made by the gas and water company,

Alderman BRENT raised the question whether members of the court being shareholders or directors in the gas and water company could vote on the subject.

Mr. PILCHER thought that shareholders or others having an interest in the gas company could vote, because the water supply was quite a separate undertaking.

Alderman BRENT thought the two undertakings were mixed up together. For instance, the cost of obtaining increased powers by the water company came out of the profits arising from the gas supply.

The TOWN-CLERK said that the Canterbury Gas and Water Company

an independent company under another title, and to proceed with the work free from the trammels of such an impolitic agreement.

A case of considerable importance to the metropolitan gas companies came before the Guildhall Police Court on Friday. The Great Central Company were summoned for not having supplied gas to a refreshment-room keeper in Basinghall Street after having been required so to do. On the behalf of the company it was alleged that the complainant had failed to give the gas company security for the payment of the gas supplied to him; but it did not appear that the application for security had been given in writing, as provided by the 15th section of the Act. The magistrate, therefore, fined the company £5, and £2 2s. costs. Notice of appeal was given by the company against this decision.

On the dissolution of any public company, or its amalgamation with another body, the condition of the clerks thus thrown out of employment is always a melancholy consideration. The sale of the works of the United General Gaslight Company to the Alliance Company of Dublin has given rise to circumstances of this character. The Alliance Company liberally awarded the sum of £4000 as compensation for those officers whose services they did not retain, and at the half-yearly meeting of the United General Company, on the 5th inst., the compensation of their officers formed the principal subject of discussion. A letter from Mr. Galbraith, in another column, represents the grievances of himself and another brother officer, who, having accepted an appointment in the Alliance Company at a reduced salary, expected to come in for some share of compensation. It appears, indeed, that they had been induced to withdraw their opposition to the Bill when before Parliament on some promise of the kind, and they seemed, therefore, on that ground, entitled to more consideration than they have received from the shareholders. It is also remarked, that while the Alliance Company granted £4000 to compensate the officers of the United General Company, the latter have only contributed £500 for that object, and, though the directors are placed in difficult circumstances, the shareholders could scarcely have objected to a more liberal compensation.

In consequence of rumours of intended interference with the supply of gas in Dublin by the Fenian madmen, the gas-works have been garrisoned by a strong force of the admirable body of constabulary to whom Ireland is so much indebted for the order and tranquillity which has been maintained under the late trying circumstances. It is a novel feature in the history of gas lighting to have armed bodies of men stationed within the works to protect the gasholders.

An unforeseen objection to the plan of subways for laying gas and water pipes has presented itself at Madrid. It appears that housebreakers there take advantage of access to the houses which may be obtained through the sewers to carry on their operations in that direction, and it has been found requisite to organize an underground police force for the prevention of burglaries—a provision certainly not contemplated by the Metropolitan Board of Works in the extension of their subway scheme.

Dr. Frankland is delivering a course of six lectures at the Royal Institution, on "Coal Gas," reports of two of which we publish in another column. There is, perhaps, no living chemist who has so profoundly investigated the subject, nor one to whom the profession will bow with greater respect, even though the results of his researches tend to upset previously received theories. One of the theories hitherto considered as established is, that the luminosity of a gas-flame depends on the incandescence of the solid particles of carbon it contains; but Dr. Frankland's experiments seem to throw doubt on the cause of the phenomenon, and to the consideration of these point his two first lectures were principally directed.

An explosion took place in the purifying-house of the Rochdale Road station of the Manchester Corporation Gas-Works, on Sunday, the 10th inst., which caused considerable damage to the works, but was fortunately not attended with any loss of life. It appears to have been caused by some derangement of the hydraulic valve, by which the current of gas is changed from one purifier to another; but the exact nature of the derangement has not been stated. The accident points to the necessity of having all such valves covered, or, what would be better still, the employment of Messrs. E. Cockey and Son's admirably contrived but simple valve, by which such derangements become impossible.

A Bill has been introduced by the Government, which is now passing through the Commons, for the abolition of certain exemptions from local dues on shipping, and on goods carried in ships, which may prejudicially affect gas companies in seaports, who land their coals at their own or private wharves, and companies so situated should lose no time in concerting measures for their protection.

Correspondence.

UNITED GENERAL GAS COMPANY AND THEIR LATE OFFICERS.

SIR,—As my name was rather prominently brought forward by the chairman at the half-yearly meeting of the above company, on Tuesday last, at the London Tavern, will you kindly allow me, through the medium of your valuable journal, to say a few words in reply. I am the *senior* officer of the company, having spent nearly forty years in its service. It is true that I have obtained a situation in the amalgamated company; but the change in my position, from one company to another, involves a loss to me of about £100 per annum. Surely, under such circumstances, it was not *unreasonable* in me to expect some compensation from the directors of a company with whom I had been *so long* associated, and whose interests, as will be fully admitted, I have at all times endeavoured to promote to the utmost of my power. When their bill was passing through Parliament, I sought with another brother officer, Mr. Overend, to get a clause inserted securing us compensation; but from a communication received from the company's parliamentary agent, Mr. Coates, stating that if we persevered in so doing we would be placing ourselves in a "*hostile*" position to the directors, and suggesting to us whether it would not be *wiser*, on our part, to throw ourselves on the generosity of the directory? Having confidence in the directors, in an evil hour we withdrew our opposition; but, we regret to say, our confidence has been misplaced, as from the circumstance of our having obtained employment in the new company, though in both cases at a great pecuniary sacrifice, we have put ourselves "out of court," as the chairman expressed it, and are therefore not entitled to any remuneration. Having now attained, as may well be supposed from my long servitude, to the "sear and yellow leaf," and while the shadows of the evening of life are drawing around me, with increasing physical debility, which will oblige me at no distant period to relinquish my present onerous duties, and having no claim upon my present employers, in whose service I may now be regarded as a junior officer, I have the gloomy prospect of my old age being embittered by privation and penury. Had the directors read our appeal *addressed to the shareholders*, at that meeting, for whom it was intended, we are persuaded we would have had the sympathy of the proprietors then present, and the result would have been different; but it was suppressed. I am sure that many of those gentlemen held the enlightened views of Mr. Lysley, at the previous meeting, as reported in your last number, when he remarked:—"When a gentleman goes into an establishment of this kind, never foreseeing that it will be bought up by another company, he naturally looks upon it as a permanent provision, probably for life; and as this has been entirely altered, I hope the claims of those gentlemen will be considered fairly and favourably." This is my case. I hope, however, as I see that the directors have reconsidered the case of one deserving officer, and given him an *additional* grant of £300, that they will also kindly *reconsider* our case, and even now at the eleventh hour remember their old and faithful officers who have spent the prime of their lives in their service. I pronounce no opinion upon the amounts already allocated to the several officers not employed by the amalgamated company, as to their being distributed partially or otherwise, though, of course, I have my opinion on the subject; but I do say that when the Alliance Gas Company generously contributed £4000 towards compensating the officers of the United Company, the directors of that company should have supplemented their grant with a larger sum than £500.

WILLIAM GALBRAITH.

20, *Clarinda Park, Kingstown,*
March 12, 1867.

Register of New Patents.

2067.—JOHN ISRAEL ENSLEY, of the city of New York, in the state of New York, U.S.A., for "*An improved apparatus for manufacturing illuminating gas, and producing bone-black and other valuable residuum.*" Provisional protection only obtained. Dated Aug. 11, 1866.

The object of this invention is to separate the gaseous and solid constituents of various substances, retaining the gaseous matter in suitable apparatus to be utilized, and producing bone-black or other valuable residuum from the same. A retort is provided, having a fire-chamber and smoke-pipe, as usual. Within this retort a chamber is situated, the said chamber being closed, except at its outer end. A set of cylinders is constructed, any one of which fits the chamber in the retort, and is made open at one end to receive the charge to be subjected to heat. The said cylinders are provided with perfora-

tions, through which the gaseous matter evolved therein escapes. When one of these cylinders is in place in the chamber, the latter is closed by a cover, fitted in its mouth, and held in place by a pressure screw resting on a removable bearing, or by some equivalent device. In this manner the chamber in the retort is made gas-tight. A pipe extends from the said chamber and conveys the gaseous matter to one of a series of purifying vessels resting in a water-tank. These vessels communicate with each other through short pipes. Each of the said vessels is also provided with cocks, extending through the sides of the water-tank, to allow the escape of condensed water. A pipe also extends from the final condensing-chamber, through which the gas passes into a gasometer of ordinary construction, whence it is distributed in the ordinary manner. A short tube is connected to the lowest portion of this pipe, and opens in a tight barrel, communicating with a suitable pump, by which the condensed water is drawn off. This pipe is also provided with a stop-cock, by which the flow of gas through the said pipe may be stopped, and the contents of the gasholder retained.

Two objects are effected by using this apparatus—firstly, the retention and utilization of the gaseous matter envolved; and, secondly, the production of bone-black or other suitable residuum from the solid elements of the substance acted on. In ordinary apparatus for producing bone-black, the gaseous matter is driven off as worthless. In the improved apparatus herein described, all the gaseous elements are retained, purified, and are mixed where it is desirable to produce a compound gas for illuminating purposes. In this case the mixture can be effected simply by first placing the vegetable substance in the retort, to produce the requisite hydrogen, and then animal matter to produce the carbon. Three parts of vegetable to one of animal matter will produce the proper results. The apparatus is very effective for producing bone-black, and also for charring wood, retaining its essential principles. The apparatus is applicable whenever it is desirable to treat either vegetable or animal matter to separate the gaseous or liquid from the solid portions.

2072.—Désiré Marchal, of Brussels, in the kingdom ot Belgium, civil engineer, for "*Improvements in the combustion and prevention of smoke, and in increasing the heating power of fuel.*" Patent dated Aug. 13, 1866.

This invention, which is applicable to every description of furnace, oven, or grate, consists of certain improved processes by the use of which the smoke and gaseous products of combustion are economically consumed. This result is obtained by the introduction into the grate or furnace, by means of tubes, or through small lateral openings, of a current of hot air, or the vapour of water previously carburetted. Such current is previously passed through very fine metallic wire gauze, which has the effect of finely dividing the molecules of the said current before it enters into the furnace, in which they combine with the atmospheric air contained therein and the products of the substances in course of combustion, whereby the steam is decomposed and hydrogen gas evolved, which, in conjunction with the hydrogen employed, becomes instantly a sheet of flame covering the surface of the combustible fuel, and through which flame the smoke and gas seeking to escape towards the chimney must pass and are necessarily consumed.

2088.—Robert James Worth, of Stockton-on-Tees, in the co. of Durham, for "*Certain improvements in direct-acting steam-pumps.*" Provisional protection only obtained. Dated Aug. 15, 1866.

In constructing a steam-pump according to this invention the pump or water-cylinder is placed in a straight line with the steam-cylinder, and a little distance apart. The pistons for the steam and water cylinders are fastened to the same rod, and act as an ordinary double-acting steam cylinder and pump. Cast with or otherwise fastened to the steam-cylinder is a circular valve-chest, in which works a piston-valve. The faces of this valve are a little longer than the ports. Cast with or otherwise fastened to the pump is another circular valve-chest, in which works a piston-valve similar to the one employed in the steam-cylinder; but in the pump the ports are broader than on the steam-cylinder, and the faces of the valves are shorter than the ports, so that the water is not so much shut in the pump when the valve is passing the ports as to cause a disagreeable jar. By preference these valve-chests are in the same straight line, and both the valves fastened to the same rod, which is moved backwards and forwards by machinery connected with the piston-rod or either or both of the pistons.

2091.—Edwin William De Rusett, of Lewisham, in the co. of Kent, engineer, and Richard Farrell Dale, of Shoe Lane, in the City of London, founder, for "*Improvements in pumps, and in adapting them for propelling vessels and for other purposes.*" Patent dated Aug. 15, 1866.

This invention consists, first, in introducing steam and other vapour directly into the chamber or cylinder, or chambers or cylinders, of pumps, and condensing the steam or vapour therein, either by jet or surface condensation, the liquid in the pump causing the steam or vapour valves to be self-acting. Secondly, in employing the pump-chamber or cylinder as the delivery-valve, enclosing it or not in an air-chamber. Thirdly, in means or apparatus for applying these pumps for propelling and steering vessels, and for driving machinery, either afloat or ashore, and in reversing the power derived from the pumps for the propulsion of vessels, by causing the suction and delivery valves to rotate in a frame or frames as described.

2096.—Charles Brown, of 43, Mark Lane, in the City of London, gas engineer, for "*A new or improved apparatus for consuming smoke from gas and other lamps.*" Provisional protection only obtained. Dated Aug. 15, 1866.

This invention relates to a new or improved apparatus applicable to the globes of lamps in which gas or oil is burned, for the purpose of consuming the carbon or smoke escaping from the flame. It consists of a ring of metal, to which is affixed a cylinder of wire gauze, of a slightly tapering form, surmounted by a dome or cap of similar gauze, in the centre of which is a handle for the purpose of adjusting or removing the apparatus to or from the globe of the lamp. The slight amount of heat impinging upon the gauze dome is sufficient to consume the escaping carbon, and while the interstices of the gauze cylinder and dome permit of the free current of air passing through the chimney-glass or globe, the carbon or smoke is consumed by contact with the wire gauze, and is thus prevented from injuring or soiling the ceiling, walls, pictures and frames, and furniture. The flame is steadied, and little or no shadow is thrown on the ceiling by the use of this consumer. The gauze may be of iron, copper, or other suitable metal, and may be platinized in order to render it capable of enduring any amount of heat. The apparatus may be rendered ornamental by a figured border attached to the ring and around the edge of the cap or dome. It may be made of a cylindrical section, or of a polygonal section, according to taste. By this invention the necessity of suspended bell-glasses may be dispensed with, and gas used where heretofore it could not be used, in consequence of its injury to valuable decorations and furniture, as the apparatus will be found to consume every particle of smoke emitted from the flame. In some cases it is proposed to form the dome of double layers of gauze, with a small space between the two.

2125.—George Edward Moore, of Birmingham, in the co. of Warwick, metal dealer, for "*Improvements in apparatus for filtering and purifying water and other fluids.*" Provisional protection only obtained. Dated Aug. 18, 1866.

This invention consists in attaching to the nozzle or beak of taps used for drawing off water or other fluids, or to the spouts or other outflows of pumps or other apparatus for raising or drawing fluids, a chamber or reservoir of a suitable form to contain charcoal, pumice stone, sand, or other filtering, purifying, or disinfecting media. It is preferred to attach this chamber or reservoir, in the following manner, to the beak of a tap:—A collar or cover is formed, which is tapped with a screw to receive a pendent bulb-shaped cup with an outflow at the bottom, in which cup are placed pieces of wire gauze or perforated metal, between which is placed the charcoal or other filtering or purifying substance. These parts are kept in position by a ring of metal screwed into the cup, and the whole when in use is screwed into the collar or cover formed on the beak of the tap. When out of use the filtering-chamber hangs by a chain attached to any portion of the tap, and thus cleanses itself by draining. The displacement of the filtering-chamber is for the purpose of allowing the fluid to be drawn off more rapidly, when it is not required to be purified, as in the case of water used for other purposes than drinking. Or the filtering-chamber may be attached, if preferred, to one nozzle of a two-way tap or pump, the other nozzle being left free for the passage of unfiltered fluid, or it may be placed by itself behind the tap, or in any other suitable position, so that it intercepts the fluid before it is drawn off, and thus in the operation of drawing off filters and purifies it.

2145.—William Edward Newton, of 66, Chancery Lane, in the co. of Middlesex, civil engineer, for "*Improvements in the mode of and apparatus for the distillation, rectification, and disinfection of mineral or vegetable oils, applicable also to the purification and rectification of fatty and other products of such oils.*" A communication. Provisional protection only obtained. Dated Aug. 21, 1866.

This invention consists in effecting by means of steam, either superheated or not, a first and, if necessary, a second and third distillation of oils, in order to rectify and purify them, and completely deprive them of all offensive odour. The steam, generated at a greater or less pressure, is brought directly into contact with the liquid matter in all its parts and in sufficient quantity, by which means the most satisfactory results are obtained.

The apparatus which is employed for the purpose of carrying out this invention consists in an arrangement of several closed vessels or cylinders, turning on a common axle or shaft, which is hollow throughout its length, and through which the liquid disinfectant is supplied, jets of steam being also allowed to circulate therein at the same time. If necessary syphon-pipes may be applied between each cylinder, for the purpose of preventing the return of the steam. The liquid, either cold or previously heated by steam to a low temperature of, say, from 40° to 50°, in a vessel having a false bottom for that purpose, is passed into a vessel below, where it is mixed with steam. In this vessel is mounted a shaft provided with arms or beaters, to which a continuous rotary motion is imparted. By these means an intimate mixture of oil and steam will be effected, and from which vessel the products of distillation are led off by a pipe above. From this vessel the oil passes down through a pipe into the hollow shaft, on to which are keyed cylinders which turn with it. A somewhat slow rotary motion is imparted by any convenient means, such as by a band passing over a pulley. The oil passes successively into these cylinders through the hollow shaft. Each of the cylinders is furnished inside with partitions, which are somewhat smaller in diameter than the cylinders, and are serrated at their circumference for the purpose of allowing the oil and steam to pass. The cylinders are each provided below with a cock for the purpose of drawing off the material after being operated upon, and also with a trap or door for the purpose of being enabled to clean out the cylinders.

2183.—Josiah George Jennings, of Palace Wharf, Stangate, in the co. of Surrey, sanitary engineer, for "*Improvements in the water-closets, urinals, and taps.*" Patent dated Aug. 24, 1866.

The improvements in water-closets relate to closets in which the pan discharges itself by a side opening into the upright limb of a syphon-trap. This syphon-trap is made with its upright limb of cast iron, or lead, or other metal, separate from the pan, but connected thereto by cementing it into a socket. The valve-seat is formed in the upright limb by cementing into it an earthenware or glass ring. The discharge-valve has an overflow-passage formed through it, and its handle passes up through a cap fitted on to the upper end of the

upright syphon. The water-valve is carried on a bracket, which fits on and against the upper end of the syphon-limb immediately under the cap, which serves to secure it in its place. The valve is arranged in such a manner as to be opened by raising a lever, which is so placed as to be lifted with the handle of the discharge-valve. The bracket is made of a trough-like form, so that should the supply-valve leak at any time, the water so escaping is conducted at once into the trap. Or the connexions to the supply-valve and the supply-pipe and between the supply-valve and the pan may be made by union screw couplings.

Urinals, according to this invention, are constructed in a somewhat similar manner. A valve is used, with an earthenware or glass seating, by which all the pans may be emptied simultaneously, and each pan is provided with a separate overflow, at the surface of which any fluid matter may escape.

The invention also relates to the construction of taps, suitable for water, which taps are constructed with a valve, closing with the flow of the water, and there is connected with such valve a regulating piston to prevent the valve suddenly closing.

2201.—WILLIAM PIERCE, of Over Darwen, in the co. of Lancaster, manufacturing chemist, for "*Certain improvements in the method of purifying gas, whereby its illuminating properties are improved, and in the apparatus connected therewith.*" Provisional protection only obtained. Dated Aug. 27, 1866.

This invention relates to the purifying of coal gas, and to the improvement of its illuminating power, by bringing it into contact with a certain light oil made from tar, or with certain other mineral oils in a heated state, whereby the gas imbibes or becomes impregnated with an amount of carbon, given off or emanating from the heated oil. The improvements also consist in the application of steam or hot water to the heating of the said oil, and in the construction and arrangement of the apparatus for the purpose, which may be thus described :—The oil is contained in a suitable vessel, which is internally fitted with a spiral tube or worm, or with a shell or steam-jacket, either of which are surrounded with the oil, and when the steam is admitted from a steam-chest into the worm or jacket, the oil becomes heated thereby. Or, if preferred, the bottom of the vessel may be made concave, and a jet of hot water or steam may be applied thereto. This apparatus is attached between the gas-meter and the burners, and all the gas passing from the meter to the burners is caused to pass through this chamber or vessel, and thereby becomes impregnated with the gas arising from the heated oil, which renders the coal gas more pure for burning, and also increases the light obtained therefrom. An opening is provided at the top of the vessel for the supply of the oil.

2206.—The REV. THOMAS DAVIS, of Roundhay, in the co. of York, clerk, for "*An improved method of or apparatus for ventilating dwelling-houses or other buildings.*" Patent dated Aug. 27, 1866.

The object of this invention is to ensure a perfect ventilation or change of air in the rooms of dwelling-houses, or of other buildings, railway carriages, ships, navigating vessels, and in all other structures in which it is needed, without allowing a downward draught, or causing any inconvenient current. Various means are employed for effecting this object. In some cases an apparatus called a "perhauster" is used, which is fixed near the ceiling of the room or place to be ventilated, or if desirable lower down, opening into a chimney or ventilating shaft suited for the purpose. A tube, which is called a "perflator," is also used, entering and passing the ceiling, and to this, when necessary, is attached a tube communicating with the open air. The other end of this tube faces or enters the aperture called the perhauster, care being taken to leave a sufficient space around such aperture for the foul air of the room to enter and be carried forward along the tube or pipe into the chimney or ventilating shaft. A gas-burner is occasionally used, or some other rarefying agent, to give additional force to the current of air, so as to draw off from the room or apartment the foul, heated, or contaminated air contained therein.

2218.—ROBERT IRVINE, of Magdalen Bridge, near Musselborough, in the co. of Mid Lothian, N.B., for "*Improvements in treating and purifying water.*" Patent dated Aug. 28, 1866.

This invention has for its object the purification of water containing such impurities as exist in sewage, the dirty or coloured waters discharged from calico-printing, dyeing, paper and other works, as also the discoloration of peaty or mossy waters. For the purpose specified it is proposed to employ mineral charcoal obtained by the process hereinafter described, and containing silicate of alumina, free alumina or di-silicate of that earth, together with certain proportions of lime, magnesia, oxides of iron naturally present in the raw material, and with carbon in a free and finely divided state, in combination with the matters hereinafter referred to. For this purpose shale, such as is used for the manufacture of paraffin oil, is distilled or heated in retorts or close vessels, to which heat is applied, and after the oil resulting from the destructive distillation of the bituminous portions of the shale has been expelled and collected, the residuum remaining in the retort is withdrawn and quenched with water. By this means a mineral charcoal is obtained, possessing the power of disinfecting and decolorizing the hereinbefore mentioned fluid matters to a high degree, on account of the presence of a large amount of carbon in a fine state of division, as also the fact that the alumina and the silicates of that earth are in a more amorphous state than when the residuum from the retorts, or coke, is allowed to cool by exposure to the air, when decomposition ensues, and vitrific action more or less takes place.

2230.—JAMES DAVIS, of 5, Sussex Road, Southsea, in the co. of Southampton, civil engineer, for "*An improved method of treating limestone, and applying the products for purifying and rendering water palatable, and for imparting a briskness to other beverages, as also for utilizing the substances to the various purposes of the builder.*" Provisional protection only obtained. Dated Aug. 29, 1866.

For the purpose of carrying out this invention limestones, magnesia, or otherwise, are employed together, with or without the carbonates of soda and potash or one of them, which substances are reduced to the caustic state by calcining them in a retort or retorts made either of metal, mixed metals, or burnt earths. The invention relates secondly to the use of caustic lime, and the gases liberated during the conversion of the raw materials to the caustic state towards purifying and rendering water palatable, and imparting a briskness to other beverages. The invention consists thirdly of improvements in artistic designs, both ornamental and useful, in the method of imparting strength and durability to mortar, plaster, concrete, and other substances to be used in the construction of fortifications, &c., and in rendering wood, stone, brick, tile, and other porous materials used in building, impervious to water and indestructible by the natural elements by varied applications of the caustic material.

APPLICATIONS FOR LETTERS PATENT.

577.—WALTER CHRISTOPHER THURGAR, of the city of Norwich, surgeon, for "*Improved means or apparatus for regulating the supply of gas to burners.*" March 1, 1867.

579.—WILLIAM PARRY, of Birmingham, in the co. of Warwick, mineral surveyor, and JOHN FREARSON, of Birmingham aforesaid, mechanical engineer, for "*Improvements in treating or purifying sewage, and in apparatus to be used for that purpose.*" March 1, 1867.

583.—MAX GOSSI, of 11, Rue des Peignes, Antwerp, merchant, for "*Improvements in transporting, warehousing, and barrelling petroleum oil or liquids lighter than water.*" March 2, 1867.

591.—JOHN AMBROSE COFFEY, of 32, Great St. Helens, in the City of London, consulting engineer, for "*Improvements in self-acting steam and fluid safety gauges, the said improvements being applicable to cocks or taps and valves.*" March 2, 1867.

597.—WILLIAM EDWARD GEDGE, of the firm of John Gedge and Son, of 11, Wellington Street, Strand, in the co. of Middlesex, patent agent, for "*Improvements in privies or water-closets.*" A communication. March 4, 1867.

608.—HENRI ULLIEL, of the Avenue de Neuilly, in the department of Seine, France, manufacturer of gas apparatus, for "*Improved apparatus for artificial light and heat.*" March 5, 1867.

621.—JOHN GARRETT TONGUE, of the firm of Tongue and Birkbeck, patent agents and engineers, of 34, Southampton Buildings, Chancery Lane, in the co. of Middlesex, for "*Improvements in steam-engines and pumps.*" A communication. March 6, 1867.

624.—JOHN THOMPSON, of Nettlebed, in the co. of Oxford, stoneware manufacturer, for "*Improvements in the manufacture of gas.*" March 6, 1867.

633.—ALPHONSE LOUIS NORMANDY, of 17, New Park Road, Stockwell, in the co. of Surrey, engineer, for "*Improvements in engines worked by heated air and by other suitable heated gas or gases.*" March 7, 1867.

639.—ROBERT LUKE and WILLIAM PARKES, of Birmingham, in the co. of Warwick, metallic bedstead manufacturers, for "*Certain improvements in the manufacture of metallic bedsteads, part of which said improvements are applicable to cornice poles, gas-fittings, balustrades, and other articles.*" March 7, 1867.

641.—PAUL RAPSEY HODGE, of 106, Cannon Street, in the City of London, civil engineer, for "*Improvements in hydraulic motors.*" March 7, 1867.

650.—WILLIAM YOUNG, manager of the Oil-Works, Straiton, in the co. of Mid Lothian, N.B., and PETER BRASH, of Leith, in the same co., soap, candle, and oil manufacturer, for "*Improvements in the distillation of bituminous substances.*" March 7, 1867.

686.—WILLIAM BRYER NATION, of 394, Old Kent Road, in the co. of Surrey, for "*Improvements in apparatus for raising, forcing, propelling, and exhausting fluids and gases.*" March 11, 1867.

690.—JOSEPH PEARSON, of Birmingham, in the co. of Warwick, brass-finisher, for "*Improvements in ball or supply-valves.*" March 11, 1867.

692.—EDWARD THOMAS HUGHES, of the firm of Hughes and Son, of 123, Chancery Lane, London, patent agents, for "*An improved apparatus for the promotion of economy in the combustion of gas, petroleum, and other oils.*" A communication. March 11, 1867.

696.—MATTHEW PIERS WATT BOULTON, of Tew Park, Oxfordshire, esquire, for "*Improvements in propulsion, and in rotary apparatus for giving motion or energy to fluids, and receiving motion or energy from them.*" March 11, 1867.

702.—THOMAS BURT, of Wandsworth, in the co. of Surrey, civil engineer, for "*Improvements in machinery and apparatus for moving mud, sewage, sand, small gravel, or other similar matter from one place to another.*" A communication. March, 12, 1866.

708.—JOHN FOX, of West Hackney, engineer, for "*Improvements in filters.*" March 12, 1867.

709.—CHARLES MASCHWITZ, the younger, of Birmingham, in the co. of Warwick, merchant, for "*Improvements in taps and valves.*" A communication. March 12, 1867.

720.—THOMAS WALKER and THOMAS FERDINAND WALKER, both of Birmingham, in the co. of Warwick, engineers, for "*Improvements in apparatus for measuring the passage or flow of liquids.*" March 13, 1867.

721.—JOHN HAMILTON, of Glasgow, in the co. of Lanark, N.B., for "*An improved artificial material for producing gas to be used for illuminating purposes.*" March 13, 1867.

722.—WILLIAM EDWARD NEWTON, of 66, Chancery Lane, in the co. of Middlesex, civil engineer, for "*Improvements applicable to the ventilation of theatres, churches, and other large buildings, and in purifying and cooling the air supplied thereto.*" A communication. March 13, 1867.

729.—JAMES CONYERS MORRELL, of Leyland, in the co. of Lancaster, for "*Improvements in apparatus applicable to dry closets for disinfecting and deodorizing and preparing manure, parts of which are applicable to the separating of cinders from ashes.*" March 13, 1867.

GRANTS OF PROVISIONAL PROTECTION.

109.—JOHN COLVILL, of 32, Rue de l'Echiquier, Paris, in the empire of France, civil engineer, for "*Certain improvements in meters for gas and liquids, such improved meters being also applicable as a motive power.*" A communication. Jan. 16, 1867.

365.—WILLIAM JONES, of Wolverhampton, in the co. of Stafford, machinist, for "*Improvements in machinery for manufacturing the junctions of gas, water, steam, and other pipes.*" Feb. 8, 1867.

429.—ALFRED VINCENT NEWTON, of 66, Chancery Lane, in the co. of Middlesex, mechanical draughtsman, for "*An improved construction of water-meter.*" A communication. Feb. 15, 1867.

444.—GEORGE WENNER, of Horwich, in the co. of Lancaster, civil engineer, for "*Certain improvements in apparatus for preventing 'down draught' in chimneys, which may also be applied for the purpose of ventilation.*' Feb. 19, 1867.

449.—HENRY ALDER, of 32, Grange Road, Edinburgh, for "*Improvements in gas-meters.*" Feb. 19, 1867.

495.—WILLIAM EDWIN HEATH, of 7, Pembroke Terrace, Chalk Farm, in the co. of Middlesex, for "*Improvements in gas-pressure governors.*" Feb. 22, 1867.

498.—HENRY PURNELL, of Glasgow, in the co. of Lanark, N.B., engineer, for "*Improvements in motive-power engines to be worked by water, steam, or other fluid, and applicable to pumps.*" Feb. 23, 1867.

499.—ARTHUR KINDER and WILLIAM BARNS KINSEY, both of 92, Cannon Street, in the City of London, engineers, for "*Improvements in gas-engines.*" Feb. 23, 1867.

NOTICES TO PROCEED.

2827.—JAMES JOHN HOLDEN and SEALY JAMES BEST, both of Bermondsey, in the co. of Surrey, engineers, for "*Improvements in the doors or closures of gas-retorts.*" Oct. 31, 1866.

2847.—JOSIAH HARRIS, of 41, Threadneedle Street, in the City of London, for "*Improvements in apparatus for the production, distillation, and refining of hydrocarbon and other oils from shale, cannel, coal, peat, lignite, or other bituminous minerals.*" Nov. 3, 1866.

2872.—JOHN RICHARDSON WIGHAM, of Albany House, Monkstown, in the co. of Dublin, Ireland, gas and lighthouse engineer, for "*Improvements in illuminating lighthouses, private residences, railway stations, mills, factories, and other buildings, and in apparatus and gas-burners employed for that purpose.*" Nov. 6, 1866.

2873.—NATHANIEL FORTESCUE TAYLOR, of 8, Manby Street, Stratford, in the co. of Essex, gas engineer, for "*Improvements in means for operating on air or aëriform fluids by hydrocarbons for purposes of illumination.*" Nov. 6, 1866.

2883.—CHARLES JOHN ROBINSON, of 3, Old Church Yard, Liverpool, for "*Improvements in pump-valves, stop and let-off cocks or valves, especially adapted for hydraulic presses and high-water pressure.*" A communication. Nov. 6, 1866.

2908.—JAMES THOMPSON, of New Wandsworth, in the co. of Surrey, for "*Improvements in gas-stoves for heating and cooking.*" Nov. 8, 1866.

2909.—GEORGE SHAW, of Birmingham, in the co. of Warwick, patent agent, for "*Improvements in the manufacture of coke, and the small coke called breezes, and in the manufacture of coal gas.*" A communication. Nov. 8, 1866.

3372.—WILLIAM CLARK, of 53, Chancery Lane, in the co. of Middlesex, engineer and patent agent, for "*Improvements in screw-valves.*" A communication. Dec. 21, 1866.

231.—JAMES GREENSHIELDS, of Glasgow, in the co. of Lanark, N.B., for "*An improved compound or combination of materials to be used for the production of illuminating gas.*" Jan. 29, 1867.

463.—GEORGE HASELTINE, of 8, Southampton Buildings, Chancery Lane, in the co. of Middlesex, civil engineer, for "*An improved mode of and apparatus for letting on and shutting off gas, and igniting the same.*" A communication. Feb. 20, 1867.

Parliamentary Intelligence.

HOUSE OF COMMONS.

SATURDAY, MARCH 2.

A petition was deposited against the CAMBRIDGE GAS Bill, from the Corporation of Cambridge and Cambridge Improvement Commissioners; and from the Chancellor, Masters, and Scholars of the University of Cambridge.

MONDAY, MARCH 4.

SHEFFIELD WATER CONSUMERS Bill.—A petition was deposited from the Rev. Charles Walter Hudson, for dispensing with Standing Order 129, and for leave to be heard upon his petition against the Bill.

A petition was deposited against the SHEFFIELD WATER CONSUMERS Bill, from the Rev. Charles Walter Hudson.

TUESDAY, MARCH 5.

The WINDSOR ROYAL GAS Bill was reported.

The WEYMOUTH CONSUMERS GAS Bill was read a second time.

THURSDAY, MARCH 7.

The DARTFORD WATER; ETON GAS; HERNE BAY WATER; and the KIDDERMINSTER GAS Bills, were reported.

SHEFFIELD WATER CONSUMERS.—A petition was deposited from Arnold Parker, against dispensing with Standing Order 129, in the case of the petition of Rev. Charles Walter Hudson.

A petition was deposited against the WEYMOUTH CONSUMERS GAS, from William Wharton Burdon.

The SHEFFIELD WATER CONSUMERS.—A petition presented from owners, &c., of mills, &c., and deposited on Tuesday, Feb. 19, was not sufficiently endorsed for hearing before the Referees, but has since been permitted to be further endorsed by their orders.

FRIDAY, MARCH 8.

The BINGLEY GAS Bill, was read a second time, and committed.

EAST LONDON WATER Bills, &c.—The petition of the Board of Works for Plumstead District, for securing to that district a continuous supply of water at a low rate of charge, was referred to the Select Committee on the East London Water Bills, &c.

MONDAY, MARCH 11.

The MIDLAND RAILWAY (DERBY GAS-WORKS) Bill, as amended, was considered.

OTLEY LOCAL BOARD BILL.

Mr. EDWARD CRAUFURD reported from the committee on Group G of Private Bills: That in the case of the Otley Local Board Bill, they had examined the allegations contained in the preamble of the Bill, but the same had not been proved to their satisfaction.

Mr. EDWARD CRAUFURD further reported from the committee: That with respect to the petitioner, Bertie Markland, they are unanimously, of opinion that such petitioner has been unreasonably subjected to expense in defending his rights proposed to be intefered with by the Bill, and is entitled to recover from the promoters of such Bill, viz., the Otley Local Board, his whole costs in relation thereto.

TUESDAY, MARCH 12.

The BARNSLEY GAS Bill was reported: report to lie upon the table.

The ST. HELEN'S WATER Bill.—Order for committing the Bill read, and discharged.

WEDNESDAY, MARCH 13.

The WINDSOR ROYAL GAS Bill, as amended, was considered, and amendments made.

THE NORWICH LOCAL BOARD OF HEALTH BILL.

The Referees have reported on the petition of Miss Fanny Ann Martineau that this is a Bill for the better sewering of the city of Norwich, and the applying of the sewage to the irrigation of land, and for the making of the Trowse Road, and for other purposes; and of which the short title is "City of Norwich Act, 1867."

It was objected that the proposed system of sewerage, by which it was intended to intercept the existing sewers in the city of Norwich, by two main sewers, with three storm outfalls, to be carried to a pumping station on the bank of the River Tare below the town, from which point the sewage was intended to be pumped to a high level on certain lands of Mr. Harvey, which were to be irrigated therewith, was inefficient in an engineering point of view.

That a large proportion of the sewage would be too solid to be pumped as proposed, and that there was no provision for deodorizing it at the pumping station, and that in times of storm it would still be discharged into the river.

The promoters stated, in reply, that the sewage was generally of a liquid character, which could easily be pumped in the manner intended, and that in times of storm it would be so diluted as to remove the objection to its being passed into the river, and that any portion which could not be pumped would be of a description which would not require deodorization, but could be deposited in a covered building by the side of the river and removed in barges.

It was further objected that the proposed deviation of the road was bad in an engineering point of view, and a plan was produced by the petitioner to show that an efficient work could be carried out within the limits of deviation at much less expense.

The promoters stated that by their scheme the road would be carried over the railway at a convenient point, with good gradients throughout; but that by the petitioner's plan the railway would be crossed inconveniently over the cattle-pens and platform of the station, and a bad gradient of 1 in 24 would still have to be passed on the existing road.

The sufficiency of the estimate for the road deviation was also questioned, both as to the details of the work and the cost of the land, which the petitioners estimated at 8 acres.

The promoters stated that the prices estimated were those for which similar works had been executed in the neighbourhood, and that no land would have to be purchased on the property of Mr. Harvey.

It was shown that the distance from the residence of the petitioner to the pumping station was 600 yards.

The Referees are of opinion that the works are efficient for the objects proposed in the Bill, and that estimate is sufficient.

Legal Intelligence.

VICE-CHANCELLOR'S COURT.

FRIDAY, MARCH 8.

(*Before Mr.* HALL, *Vice-Chancellor Stuart's Chief Clerk.*)

COLONIAL AND GENERAL GAS COMPANY, LIMITED.—*Re* KNIGHT.

This was an application on behalf of Mr. Knight, a bankrupt, that a sum of £100, due to him from the company for personal services, should be paid to him instead of to his assignee.

Mr. PHILLIPS, on behalf of Mr. Knight, said: I find on looking at "Addison on Contracts," the law is clear on the subject that a bankrupt has a right to sue for his own personal labour, and if the assignee does not oppose I think clearly he has a right.

Mr. HOWARD (on behalf of the official liquidator of the company): We shall decline to pay unless the matter was clearly settled.

The CHIEF CLERK: You would pay if an order was made?

Mr. HOWARD: Yes.

The CHIEF CLERK: How do you differ?

Mr. PHILLIPS: There were two cases on the subject, one of *Williams v. Williams*, in Shelford's book on the old bankruptcy law, and in "Addison on Contracts," that is repeated, where it is said the bankrupt has a right to recover for his services.

The CHIEF CLERK: That was the Act of 1861.

Mr. PHILLIPS: No.

Mr. HOWARD: That case which is cited was before the Act. There is no case since 1861. I should like to be satisfied on the point.

Mr. PHILLIPS: In "Chitty" it says—"Contracts for personal labour may be enforced by the bankrupt."

The CHIEF CLERK: Look at the common sense of the thing. Supposing it was a person in a much inferior position to Mr. Knight. Take a journeyman carpenter, or anybody else who was earning his weekly wages. Is he not to do any work between his being adjudicated a bankrupt and his certificate? How is he to live?

Mr. PHILLIPS: He may apply for a weekly allowance, and if the assignees say, "We will not pay it to you," is he starve?

Mr. ALDRIDGE, who appeared for Mr. Edwards, Mr. Knight's assignee, said I make a claim to the money, on the ground that it became due to the bankrupt before he obtained his discharge.

The CHIEF CLERK: It is for personal services, is it not?

Mr. ALDRIDGE: Yes.

The CHIEF CLERK: It was long after the adjudication, which was dated the 14th of August, 1866.

Mr. ALDRIDGE: The court is entitled to everything the bankrupt becomes entitled to in any way before his discharge; but I think where a bankrupt earns anything by his personal services they do not always require it to be given up. Still I am not authorized to give it up to him. The official assignee will, no doubt, be willing to take that matter into consideration.

The CHIEF CLERK: This was for personal services rendered.

Mr. ALDRIDGE: I hardly know how the matter stands. It was for the company he was engaged.

The CHIEF CLERK: Mr. Knight was engaged by the official liquidator after the 26th of October, 1866. I cannot say the exact date, but it was after that day.

Mr. ALDRIDGE: The official liquidator entered into this contract.

The CHIEF CLERK: Yes; they agreed with Mr. Knight for the performance of certain personal services that they wanted, which alone he could perform, and it is under that contract that he claims this £100, which was the sum agreed to be paid to him. Well, then, the order of discharge is not till the 22nd of January last. But I think, if you look into the cases, as a general proposition, a bankrupt is allowed the remuneration for his personal services.

Mr. ALDRIDGE: Official assignees do not generally insist upon taking that.

The CHIEF CLERK: I do not think they can. They may make it a matter of grace.

Mr. HOWARD: Perhaps you would adjourn this matter. I think I should like to see Mr. Edwards on this point, and also to look into all the cases, in order to satisfy myself upon it.

The CHIEF CLERK: If Mr. Edwards attends here, and says he makes no claim, that prevents us from cudgelling our brains about it.

Mr. ALDRIDGE: I have attended here to state what the claim is.

The CHIEF CLERK: Will you take a note of these facts, which I can tell you are the facts. The adjudication is dated the 14th of August, 1866. It appears, either on or after the 26th of October, 1866, that this agreement was entered into with Mr. Knight for his personal services; in fact, he was to go into Spain to effect an arrangement for a part of the works of the company, and for that he was to have £100, under certain circumstances which have arisen. Then his order of discharge is dated the 22nd of January, 1866.

Mr. ALDRIDGE: And it was entered into by the liquidator, and not by the original company?

The CHIEF CLERK: No, not by the company; by the liquidator. The liquidator himself is personally liable to Mr. Knight, I take it. Then the question arose—Is the assignee entitled to it in any way? Upon looking into the case, my impression is that he is not entitled to it. Just suppose the case of a labouring man who is compelled to resort to the court. Is he to starve between the date of his adjudication and the date of his discharge? Is he to do nothing, or how is he to be kept? If everything he earns belongs to the official assignee, he must starve.

Mr. ALDRIDGE: I believe in a case of that kind, where a man is earning irregular wages, the official assignee never does claim it.

The CHIEF CLERK: I cannot see much distinction between that and earning a specific sum.

Mr. ALDRIDGE: I was not aware how the contract arose.

The CHIEF CLERK: I think we had better adjourn it.

Mr. HOWARD: As to the costs. I shall expect them to be paid by Mr. Knight.

The CHIEF CLERK: You cannot ask Mr. Knight to pay the costs. They must come out of the assets of the company. I will adjourn this till Tuesday, the 12th of March, at half-past eleven, and you will in the meantime consider whether you cannot waive your right.

Mr. ALDRIDGE: Yes, I will.

TUESDAY, MARCH 12.

Two summonses came before the chief clerk in this matter, both for obtaining special orders to substitute service on the defendant's clerk at his office in place of personal service, and to enforce payment of arrears of call which had been previously ordered. No one appeared to oppose, and orders were made as asked. In one case it was stated by Mr. Davis, on behalf of the official liquidator, that the defendant was a solicitor, practising at Westminster, who had been the promoter of several companies, and there was reason to believe that he was purposely keeping out of the way, in order to avoid personal service; and they could not obtain information where he resided.

The CHIEF CLERK said that after the summons had been served at defendant's office, Mr. Davis had better make an inquiry there to know if he had received it, in order that there might be something on which to found an attachment.

SATURDAY, MARCH 16.

The summons taken out by Messrs. Tayloe, on behalf of Mr. W. Riddell, to amend the register of shareholders by the removal of his name and the substitution of that of Mr. Hodges, to whom he had transferred his remaining shares in September, 1865, came on, upon adjournment, this morning.

Mr. DAVIS, from Mr. Howard, for the official liquidator, read the cross-examination of Mr. Alfred Mendham, late secretary to the company, taken before Mr. Bevan, on the 12th inst. The principal effect of this was that the transfer executed by Mr. Riddell was brought into the office in September or October, 1865, that it "must have been" brought before the directors, and it was most probably taken away by Mr. Hodges. He did not recollect what was done when the transfer was brought before the board, but it was most probably postponed, although he did not know of any reason for so doing. Mr. Hodges had been approved as the transferee of other shares. He also stated that he made the entry in the *agenda*-book with reference to these 26 shares after the resolution to wind up, but the word at the end of that entry, "negatived," was not in his handwriting. Mr. Davis added, that the book in question was not produced at the cross-examination, as the handwriting of the word "negatived" appeared to be the same as the rest.

The CHIEF CLERK said that before they went further into the matter it might be as well to ask what was intended to be done.

Mr. DAVIS said if the decision were against him he should certainly take it into court. He thought it would be more satisfactory to hear the case in chambers first.

Mr. TAYLOE did not see the object of going through the case if it was to be adjourned afterwards into court.

The CHIEF CLERK said that perhaps he had better hear something about it, as the judge would probably refer to him.

Mr. DAVIS proceeded with reading the cross-examination, which stated further that subsequently to September, 1865, the secretary had sent circulars to Mr. Riddell, in common with all the other shareholders, and that one of those circulars had reference to the winding up of the company. These circulars were not sent, however, in respect of the 26 shares in dispute, but because Mr. W. Riddell was acting under a power of attorney for his brother, Mr. J. H. Riddell, in regard to other shares. There was no entry in the books of the company with reference to this power of attorney. In re-examination Mr. Mendham said it was his duty as secretary to bring all transfers before the board, but he had no distinct recollection of having done so in the case of the transfer from Mr. Riddell to Mr. Hodges. He should have sent the circulars to Mr. Riddell although he had known of the transfer to Mr. Hodges. Then Mr. Riddell, in cross-examination, said he had received some circulars from the company, amongst others the notice convening the meeting to consider the winding up, but he had received them on behalf of his brother. He could not say distinctly whether he had received them direct or whether his brother had sent them on to him. Mr. Davis then said it appeared from the evidence of the secretary, in his affidavit and on cross-examination, that the consideration of the transfer had been in all probability postponed by the directors.

The CHIEF CLERK asked to look at the *agenda*-book referred to, and said that the word "negatived" appeared to be in the same handwriting as the former portion of the entry.

Mr. DAVIS said it certainly looked so, and he did not contend for more than that the transfer was postponed. The whole evidence showed that in all probability the transfer was postponed, for what reason did not appear, and then it appeared afterwards that it was negatived; and further it appeared that while the transfer had been lodged in September, 1865, Mr. Riddell had received notices and circulars from the company down to September, 1866. Mr. Riddell himself could not say that the transfer was properly registered, and now, the company being in liquidation, he could not come as against the creditors and ask to be relieved of his liability.

The CHIEF CLERK asked if there was anything in the constitution of the company in the Articles of Association limiting the directors as to the registration of transfers.

Mr. DAVIS said the articles gave the directors a general power.

Mr. TAYLOE said it was not contended upon the other side that the transfer was ever refused, except upon Nov. 1, 1866, after the date of the resolution to wind up. There was no evidence adduced to show that it ever was negatived, because the *agenda*-book was not in evidence. The practice seemed to have been for the secretary to have entered on one side the business to be transacted at the meeting, and for the chairman to have made a memorandum of the result opposite; but in this case the word "negatived" was evidently in the handwriting of the secretary.

The CHIEF CLERK said it was evident, according to both sides, that the transfer never was registered.

Mr. TAYLOE said that, upon the case as he presented it, it was immaterial whether it was registered or not, because it would be remembered that his case was that the transfer was left at the office, and it was the neglect of the directors not to register it, and in support of that view he had cited Nation's case.

The CHIEF CLERK said it appeared to him a fact which nobody could dispute that the transfer never was registered.

Mr. TAYLOE said he could not prove that it was registered, but he might do his best to show that the non-registration was the fault of the company and not of himself.

The CHIEF CLERK said that was based upon the assumption that it never was registered, which he wanted to get undisputed. He did not want Mr. Tayloe to admit anything which ought not to be admitted, but he thought this might be admitted.

Mr. TAYLOE said he was quite prepared to do that. He could not contend that it was registered, because the books of the company showed that it was not, so far as the ledgers had been produced.

Mr. DAVIS said it was in evidence that it was not registered.

Mr. TAYLOE said that at present he was only contending that it never had been refused, either before or after the expiration of the company, and it was quite plain, and in fact was admitted by the other side, that it never was refused during the existence of the company. They said it had been refused after the resolution had been passed for winding up; but he said that that was not proved at all satisfactorily. The entry in the *agenda*-book under date Nov. 7 was all in the handwriting of Mr. Mendham, and there was nothing in fact to show that it ever came before the board at all.

The CHIEF CLERK said that might be thrown out of the question.

Mr. TAYLOE said, throwing out of the question that it ever had been refused, and admitting that it never had been registered, he contended that it was the duty of the office to have registered it. It was brought in in September or October, but never registered. Then what was done with it? Mr. Mendham said he did not remember what was done with it, but he should think it was returned to Mr. Hodges; but any value in that expression was withdrawn by the very next sentence, in which he said the directors probably either directed the registration or postponed the consideration of it.

The CHIEF CLERK: Had they a right to postpone the consideration of it? Was it not their duty either to register it or reject it?

Mr. DAVIS thought not.

The CHIEF CLERK: Had they any right as between vendor and vendee to postpone it for an indefinite period? He added that he did not think any of the decided cases went the length of showing that the directors could of their own *ipse dixit* postpone such a matter indefinitely; they must either accept or reject within a reasonable period, and it did not appear that they had done this.

Mr. DAVIS contended that this consideration would not affect the question as against a liquidator acting on behalf of the creditors.

After some further discussion,

Mr. DAVIS said he should ask to have it adjourned into court.

The CHIEF CLERK said they had better hear what he thought about it, taking his opinion for what it was worth. His feeling was this, that the assignment was made and completed in September, 1865; that it was brought in to be registered, but from some cause, which was unexplained, it was not registered. What was a vendor or purchaser to do under such circumstances? Were they to be prejudiced by the act of directors who did not take the proper means for disposing of the transfer? None of the case cited seemed exactly to touch the point, and he would, therefore, adjourn it into court at Mr. Davis's request, to come on as a motion.

GUILDHALL POLICE COURT.

FRIDAY, MARCH 15.

(*Before Alderman* COPELAND *and Alderman* WILSON.)

HAYES *v.* GREAT CENTRAL GAS CONSUMERS COMPANY.

In this case the gas company were summoned under the provisions of the Metropolis Gas Act, 1860, for that notice in writing having been given them, dated the 1st day of March instant, requiring them to furnish a supply of gas to the complainant in the said City, they had unlawfully and wilfully failed so to do for seven days after the date of such notice, against the Statute, &c.

Mr. HOPE, jun. (solicitor), appeared for the plaintiff, who, he said, had become the tenant of a beerhouse, dining-room, and luncheon-bar called the "Brougham," at the corner of Masons Hall Alley, Basinghall Street. The summons was taken out under the 17th section of the Act 23 & 24 Vic., c. 125, and the circumstances of the case were briefly these:—Mr. Hayes having become the tenant of the premises, gave notice under this section of the Act that he required a supply of gas, and called upon the company under the section named to furnish him with that supply within a period of seven days. The company, however, had wholly neglected to comply with that demand to the present time, by which they had rendered themselves liable to a penalty of 40s. per day since the expiration of the notice, and this penalty the complainant now sought to enforce.

Mr. John Hayes, examined by Mr. HOPE.

I live at 15, Basinghall Street, and am a licensed beershop-keeper. My house is called the "Brougham Luncheon-Bar." As I wished to obtain a supply of gas, I applied in writing, on the 1st of March, to the Great Central Gas Company to furnish me therewith.

The CLERK: Where is the notice?

The notice was handed up, and was as follows:—

To the Great Central Gas Consumers Company, 28, Coleman Street, London.

We, the undersigned, herewith give you notice under the Act of Parliament of the 25 & 26 Vic., c. 125, and which said Act is entitled the "Metropolis Gas Act, 1860," to supply us with gas and meter, upon the premises known as the "Brougham Luncheon-Bar," being the basement of No. 15, Basinghall Street, London, of which we are the tenants; and should you wilfully fail to do so on or before seven days from the date hereof, we shall hold you liable under the above said Act.

Dated the 1st day of March, 1867.

(Signed) MICHAEL DUFFY,
JOHN HAYES.

Witness to the signatures of Michael Duffy and John Hayes,
C. F. HOPE,
Clerk to Benjamin Hope, solicitor, 9, Ely Place, Holborn.

Mr. HOPE: I will prove the delivery of the notice, of which this is a copy, unless the defendants admit the receipt of it.

Mr. BANNISTER (solicitor to Great Central Gas Company): You had better prove it.

Charles F. Hope, examined by Mr. HOPE.

I am clerk to the solicitor in this case. On the 1st of March I attended at the office of the Great Central Company, in Coleman Street, and delivered the notice of which this is a copy. I delivered it in the inspector's office by putting it on the counter. There were two persons in the office, who came forward and took it up.

Cross-examined by Mr. BANNISTER: I do not know who the persons in the office were, and I did not ask them who they were. I told them the notice was for a supply of gas, and left it on the counter. The persons who were there did not read the notice.

Mr. *John Hayes* recalled, and further examined by Mr. HOPE.

In consequence of the non-supply of gas I have been hindered in my business, and have been obliged to keep the house closed. I require gas for cooking sausages and steaming potatoes, as well as for lighting the premises. The company have not given me any supply since they were served with notice. Their main is laid through the street, and all the fittings are in the house. I only require the gas to be laid on to enable me to begin business.

Cross-examined by Mr. BANNISTER: I have not seen anybody from the gas company since I gave the notice, and have never been asked by them to give security for the payment of the gas-rent. Mr. Duffy is my partner. I do not know whether he has ever been asked for a deposit. He is now in the court.

Re-examined by Mr. HOPE: I have never received a demand from the gas company, either in writing or in any other way, for a deposit.

Mr. BANNISTER said there was a preliminary objection to the plaintiff's claim. The notice upon which the claim was founded was signed "Michael Duffy and John Hayes;" but the summons was obtained by John Hayes alone. It followed, therefore, that if John Hayes was entitled to a penalty so was Michael Duffy, and the company might hereafter have a demand from him also.

Alderman COPELAND said the magistrates had power to amend the summons, and would do so.

Mr. BANNISTER said he should then ask that Mr. Duffy be examined, or else that the case be adjourned.

Mr. HOPE said he could not understand why Mr. Duffy should be wanted. He certainly should not call him as his witness.

Mr. BANNISTER said he should call an officer of the company to prove that a notice of deposit being required, had been handed to the plaintiff.

Mr. *George Church*, examined by Mr. BANNISTER.

I am an inspector of the Great Central Gas Company. I found the notice requiring a supply of gas, signed by Michael Duffy and John Hayes, in the letter-box of the company, on Saturday, March 2nd. It was closed, and I did not read it. It did not come under my notice officially until Wednesday, March 6th. I then went round to the "Brougham," and saw the complainant. I told him we should require a deposit of £5 before the gas was laid on. He offered to give me a promissory note for the amount. I told him I could not take that, and that he must pay the £5 in cash. He said he had not got the money by him, but would send it to the office by the following Saturday, which was the 9th inst. He did not make any objection to give security, nor to the amount asked for, but promised he would send it on.

Cross-examined by Mr. HOPE: I did not serve the complainant with notice in writing that we required a deposit. There were three or four persons present at the time. When I went I asked for Mr. Hayes, and he came forward. I am acquainted with the provisions of the Act of Parliament. I do not remember that section 15 requires that the notice requiring security must be given in writing.

Mr. BANNISTER said this summons was taken out under the 17th section of the Act, which provided that "If the gas company, not being entitled to require, or not having required any security, wilfully fail for seven days after being thereunto required in writing by the consumer, or where the security agreed on or determined by the magistrate is given, shall wilfully fail for fourteen days to provide and lay on all proper and sufficient communication, service, and other pipes, or to furnish a supply of gas," they should be liable to a penalty. Now, it had been proved in this case that the company did require security, and that the plaintiff agreed to give that security; but the complainant had made default in performing his promise, and, therefore, could not maintain a claim against the defendants. The company were ready at any moment to fulfil their obligation, and lay on the gas forthwith, and it was from the complainant's own neglect that he was still without a supply.

Alderman COPELAND remarked that the 15th section clearly required that the demand for security from the consumer must be in writing. If the company thought it necessary to have a deposit they must give notice thereof in writing, and not merely in the course of conversation. The 15th section said—"Provided that the owner or occupier, if so required in writing by the gas company or any of their officers, shall, before he is entitled to have the pipes provided and laid, or to have a supply of gas or of meters furnished, give to the gas company such security for the payment of the rate for the gas to be supplied to him, and of the meter-rent for every meter to be supplied to him, as he and the gas company agree on." It was perfectly clear that a mere parole notice was not sufficient.

Mr. BANNISTER submitted that the 17th section of the Act was a highly penal clause, and must be construed strictly. According to that section it was clear that no requisition in writing was necessary if security were demanded. He apprehended that the words "in writing" were omitted in this clause, although inserted in the 15th, in order to guard against cases like the present. The magistrates would remember that according to the evidence the complainant had consented to give security, and therefore he had waived his right, if such existed, to have a written requisition.

Alderman COPELAND: You, as a legal man, must know that he could not do that.

Mr. BANNISTER: I submit, sir, that he could.

Alderman COPELAND: We are bound by the terms of the Act of Parliament.

Mr. BANNISTER: I must struggle against a conviction in this case, for it is a matter that is highly important to the gas company. I am entitled to ask that the 17th clause, which, as I have said, is a highly penal clause, should be construed strictly, and so construed it is clear that the complainant has no case.

Mr. HOPE: It may be highly important to the gas company, and it is also highly important to my client, whose shop is shut up all this time, and who is losing all the profits he would have made if he had been furnished with a supply of gas.

Mr. BANNISTER: The gas company have already lost a considerable sum of money by this house. There have been as many as nine tenants in it during the last six years, and it is therefore only reasonable that they should ask for security.

Alderman COPELAND: The law is that if a party applies to them for a supply of gas and fails to give the security they demand, they are quite justified in refusing to give him a supply; but they must comply with the provision in the Act, which says that this demand must be in writing. That they have not done. I hope you have the power of appeal, but I have quite made up my mind on the subject.

Alderman WILSON: If you show that you have complied with the Act of Parliament you will succeed.

Mr. BANNISTER: I cannot struggle any longer against your determination if you have made up your minds, but I hope you will fix the penalty at such an amount as will enable us to appeal

Mr. HOPE: The penalty is 40s. a day for eight days, and under section 32 I am entitled to ask for costs.

The CLERK: Where is the power of appeal in the Act?

Mr. BANNISTER: The 46th section gives the power of appeal.

Alderman COPELAND: I see from what you have said that this is a matter of importance to the gas company, but the fact of their having lost a great deal of money by previous tenants has nothing to do with the present complainant. I think it will answer all the purposes of the case, as perhaps the company will now lay on the gas without requiring further notice, if we fine them £5.

Mr. BANNISTER: I beg to give notice of appeal against that decision.

Alderman COPELAND: Let Mr. Hayes stand forward. (To complainant:) What rent do you pay?

Complainant: £170 a year.

Alderman COPELAND: Have you got a lease?

Complainant: No, sir.

The CLERK: He has been obliged to keep his house closed since the 1st of March.

Mr. BANNISTER: You will remember, sir, that Mr. Hayes swore that no notice had been given and no security required.

Complainant: I swear that no notice was given, and that no person from the gas company came to me.

Mr HOPE: I am quite ready to try that question, if necessary.

Alderman COPELAND (to complainant): You heard the evidence of Mr. Church, the inspector. He swears that he saw you.

Complainant: I swear that he did not.

Alderman COPELAND: I shall not alter the penalty; but if I had known the complainant paid so large a rent for the house, which he is obliged to keep shut up, I should certainly have inflicted a larger penalty.

Mr. HOPE: What are we to do for gas now?

Alderman COPELAND: I cannot give you my opinion upon that; but if they do not lay on the gas I shall grant another summons.

Mr. HOPE: I shall ask for that summons now.

The defendants were then fined £5, and two guineas costs.

Miscellaneous News.

UNITED GENERAL GASLIGHT COMPANY.

The Half-Yearly General Meeting of this Company was held at the London Tavern, on Tuesday, the 5th inst.—R. HUDSON, Esq., in the chair.

The SECRETARY having read the advertisement convening the meeting, the following report and accounts were taken as read:—

The directors have to submit the report and accompanying accounts of the company's operations, by which it will appear that the profits of the half year ending December 31st, amount to £2777 4s. 2d.

The proprietors having so recently, at the special meeting, been made acquainted with the position of the company's affairs at Dublin, and the amount to be received under Act of Parliament, the directors consider it unnecessary to recapitulate the same, but refer the proprietors to the annexed balance-sheet for the several items connected with the transfer of the property, and their bearing upon the company's operations.

The directors are happy to state that the business at Limerick continues to improve.

The profits, as before stated, amount to £3777 4s. 2d., which, added to the dividend reserve-fund, makes a total of £3970 2s. 0d., from which the directors recommend that a dividend of 6s. 8d. per share, free of income-tax, be declared payable on and after the 1st of April next.

The committee have taken into consideration the applications of the officers of the company for compensation, and they have much pleasure in recommending that the following gentlemen, whose services have not been retained by the Alliance Company, should receive the sums opposite their respective names, viz.:—

1835—Mr. Sanders	£2000
1846—Mr. Ogg	1500
1830—Mr. Naghten	400
1836—Mr. Fullwood	300
1857—Mr. Graves	300

being a total of £4500, or £500 more than the £4000 to be paid under the agreement with the Alliance Company, and applied under the 14th head, "by the United Company at their discretion, in or towards making compensation to such as they think fit of their officers and servants, whose services are not required by the amalgamated company."

The following persons are in receipt of the annuities set opposite their respective names:—

Mrs. Gibbings	£100 0 0 a year.
Mrs. Alder	40 0 0 "
Joseph Naylor	18 4 0 "
Mrs. Murphy	13 0 0 "
Mrs. Hynes	6 10 0 "

Dr. *Abstract of the Profit and Loss Account, for Half Year ending December 31, 1866.* *Cr*

To Coals used			£9,154 0 0	By Gas-rental	£15,449 5 0
Lime			125 17 0	Residual products	3,092 18 5
Wages paid			2,211 13 10	Cork interest	402 18 6
Wear and tear			1,817 16 6	Alliance and Dublin Company	3,331 17 9
Meters and repairs thereof			656 12 0		
Public lamp repairs			84 19 10		
Rents, rates, and taxes			610 4 10		
Directors	£300 0 0				
Auditors	42 0 0				
			342 0 0		
Salaries and collectors commission			3,002 11 0		
Charges, pensions, &c.			1,028 14 8		
Bad debts and allowances			120 14 7		
Property-tax			155 16 8		
Interest for balance of account			88 14 7		
Investment for Limerick deterioration of works			100 0 0		
			£19,499 15 6		
Net profit carried down			2,777 4 2		
			£22,276 19 8		£22,276 19 8

Dr. *Appropriation or Dividend Account.* *Cr.*

To Dividend on 9000 shares, at 6s. 8d. per share	£3,000 0 0	By Dividend reserve account	£1,192 17 10
Balance of unappropriated profit	970 2 0	Net profit brought down	2,777 4 2
	£3,970 2 0		£3,970 2 0

Dr. *Abstract of the Balance-Sheet, December 31, 1866.* *Cr.*

To Capital			£450,000 0 0	By General investment		£193,659 14 2
Unpaid dividends			1,686 3 10	Alliance Gas Company, for sale of Dublin, Kingston, and Bray works	£240,000 0 0	
Sundry tradesmen, outstanding for stores and accounts			13,905 10 3	Book debts, stocks, and sundry materials	26,511 0 0	
Cork Consumers Gas Company, for interest on bond received			1,135 9 11	Compensation to officers	4,000 0 0	
Insurance account			1,513 15 11			270,511 0 0
Bills payable			502 9 5	Stocks and products at Limerick	£5,931 0 11	
Dividend reserve-fund	£1,192 17 10			Retorts, fire-goods, &c.	629 3 6	
Current profits	2,777 4 2			In hands of agent	157 0 9	
		3,970 2 0				6,717 5 2
Loan, Bosanquet and Co.		8,000 0 0		Law, parliamentary costs		5,647 17 1
				Due from sundry persons		3,486 4 1
				In hands of bankers	£551 18 7	
				Petty cash	5 1 9	
						557 0 4
				Bills receivable		134 10 6
		£480,713 11 4				£480,713 11 4

The committee do not think it necessary to recommend any special provision for them. The interest on the money proposed to be set apart as additional capital for Limerick will, for the present, provide for their payment.

The capital account of the company at Limerick, on the 31st of December last, may be stated as follows:—

General investment on works, &c.	£21,279 10 0
Present value of meters, not included in the above	1,917 19 11
Working capital, consisting of book debts, stocks, &c	5,843 14 10
Total	£29,041 4 9
If to this sum is added	6,958 15 3
The total Limerick capital will be	£36,000 0 0

which, divided amongst the 9000 shares, would give to each share an interest of £4 in the Limerick undertaking. Your committee recommend that the above-mentioned sum of £6958 15s. 3d. should be appropriated to the Limerick undertaking, and that it be invested, until required for the purpose of extending the company's operations, or otherwise strengthening their position.

With respect to the ultimate assets, the amount cannot be at present accurately ascertained, and your committee recommend that these should be distinctly shown in the report and accounts which the directors will have to lay before the proprietors at their half-yearly meeting in September next, with the view of their final appropriation.

The Chairman said: Gentlemen, as the report of the directors and the balance-sheet has been in your hands for some days, perhaps you will take it as read to save time. If you wish them to be read, they shall be read. As you do not seem to wish it, I will make only a few remarks upon them. There seems to have been among some of the proprietors—at least, such has been mentioned to me—some little misunderstanding as to one or two items. I will merely allude to one of them, which has reference to the directors and the sum of £300, which, they say, appears to show a little discrepancy from what I stated at the last meeting only a short time ago, that the directors had not taken their allowance; and that is a fact. This £300 is down to the 29th of September. On the 29th of September the works were made over to the Alliance Company, therefore, all the charges of the directors stopped on that day, and that remains, as I stated before. With respect to the gas-rental, all that of course only comes up to the 29th of September, when we handed the works over; but there are a great number of charges that we had to pay and continue on up to the 31st of December, and we could only declare a dividend on what we actually earned. We, therefore, propose to give you 6s. 8d. which, with the £11 13s. 4d. which we mentioned before, would make £12 on each share respectively, which with the 1½ share fully paid up will be £15. I have now to make a few remarks on another subject. You having appointed three of your body to confer with the directors as to the compensation to be given to those officers of the company whose services were not retained by the Alliance Company, I may say, we found the assistance of those gentlemen of material use to us. We took the matter into our deepest consideration, and I hope what we have put down here will be perfectly satisfactory to you. We have done the best we could with the assistance of those gentlemen who were appointed, and we hope we have acted with fairness towards the company. At the same time, I must say that there are some gentlemen who are rather discontented. My friend on my left has got a letter which he has only put into my hands just before the meeting commenced, from two officers, Messrs. Galbraith and Overend. I do not think it is necessary to read the letter, but I should be happy to read it to the meeting if you wish it. Although these gentlemen were with us some years, they were both taken on by the Alliance Company. No doubt that company thought it was essential in taking our business that they should take some of the officers, and they have not only taken Mr. Galbraith, but they have taken his son also; but if you think there are reasons why they should be included in the compensation, we shall do it. I should say they went over directly to the Alliance. They went over on the 29th of September, and we paid them up to the 31st of December, and under those circumstances, I should say, as to compensation they are out of court. There is but one other thing I should mention, and that is with respect to Mr. Graves. I do not mention it with reference to any difference in the amount which we have put down for him. Mr. Graves, I dare say, many of you recollect. He was a very valuable officer, but his health has been in an impaired state for some years. Had he continued, I think he might have been able to carry on his duties, but in his present state he is incapacitated from going and seeking employment elsewhere. Under those circumstances I mention it, and put it to the liberality of the proprietors whether they think fit that anything should be added to what we have put down as compensation for him. There are others who might say, "We are in the same scale," and claims may come in from Ireland and other places; and so, gentlemen, I leave the matter in your hands, and perhaps some proprietor who knew Mr. Graves might think and say that he is entitled to an addition. With those few remarks I do not think I need trouble you longer, but I move that the report as presented, and the balance-sheet of accounts be received and adopted. If any gentleman has any question to ask, I shall be happy to answer him; and I also move the report of the joint committee as to the compensation.

Mr. Crossland: I rise to propose emphatically that an increase be given to Mr. Graves, considering his family, and the impaired state of his health. There are only two gentlemen in the London department—Mr. Ogg, who gets 3 years salary, and Mr. Graves, who gets 1½. I think they ought to be treated alike, and that they ought to receive 3 years salary; and I beg to propose a resolution to that effect.

Mr. Doane: I beg to second that.

The Chairman: Perhaps you will say why.

Mr. Crossland: I think that both those gentlemen ought to receive the same.

The Chairman: He has not been the same number of years.

Mr. Crossland: But he is in an impaired state of health.

A Proprietor: I should like to ask what you suppose will be the loss on each share to the proprietors.

The Chairman: It is impossible to state that.

Mr. H. P. Stephenson: Our shares originally were £50, and, as I have stated at one or two meetings, the probability is, including any premium from the Alliance shares, the proprietors of this company will receive £34; therefore, deducting £34 from £50, you may reckon a loss of £16, which represents the loss on the Plymouth works, the Cork works, and the Dublin works—the Limerick works being in the £34.

A Proprietor: With respect to the officers, may I ask who Mr. Sanders is?

The Chairman: He has been in the office ever since 1835, and he is our agent, our representative in Dublin.

The Proprietor: And he was paid a salary?

The Chairman: Yes.

The Proprietor: How much was the salary?

The Chairman: £700 a year.

The Proprietor: A very good salary too. Then, who is Mr. Ogg?

The CHAIRMAN: The secretary.
The PROPRIETOR: He was a director.
The CHAIRMAN: No. He acted under the board.
The PROPRIETOR: And how much did he have?
The CHAIRMAN: £500 a year.
The PROPRIETOR: An excellent salary. Mr. Naghten, who was he?
The CHAIRMAN: The ledger-keeper.
The PROPRIETOR: How much did he have?
The CHAIRMAN: £200 a year.
The PROPRIETOR: That is very good. It is a banking clerk's salary. Fullwood, how much did he have?
The CHAIRMAN: £200 a year and a house.
The PROPRIETOR: Equal to £300 a year. (Cries of "No, no.") Yes, i is. Now it seems extraordinary, as men of business, that we should do this. Take any commercial house in this large City—any house you like, start with any business you like—and if the returns are satisfactory to the employer he may be liberal and make a compensation to his servants; but, if he finds he is becoming a bankrupt, or that he is losing, what is the consequence? He discharges those servants, and shuts up his establishment. As to compensating those servants, he does nothing of the kind. He discharges them, or gets others in their place. I have never attended these meetings; but, I think, instead of doing what you are proposing, you should have turned out the whole of the directors, and tried fresh ones. The persons who buy this property do not buy it with their eyes shut. They are going to pay for it, and they wish to make a profit on it; and I say that you ought to be honest before you are liberal, and you cannot afford to give these men the compensation you talk of. What you call compensation I do not understand.

The CHAIRMAN: Is the worthy proprietor aware that this is not exactly our own money, but what the Alliance gave us? £4000 to be divided amongst our own officers, if they did not take them.

The PROPRIETOR: Would they have done it if they had not seen their way clear?
The CHAIRMAN: Can we divide it otherwise?
The PROPRIETOR: Would they not have given us the money?
The CHAIRMAN: We do not know.

Another PROPRIETOR: If we look at our position in 1855, we shall see how we have depreciated. Our directors, at the last meeting, told us that our shares were marketable at £28. Now I could not sell mine. I could never get a bid for them. We are fleeced like sheep, and are brought down little by little; but I think, as the £4000 has been sanctioned, let that be carried out. As to the other £500, I think it would be wrong to hold it forth. Again, with respect to the Limerick affair, there is about £29,000 distributed, and perhaps we shall never see a shilling of it. At the last meeting the idea was that our shares would be worth about £38.

Mr. STEPHENSON: I beg to say that I replied to that question, and I stated then, most distinctly, that if the company obtained their maximum of £270,000, you would realize £38 a share, but if under the arbitration there was a minimum of £240,000 given, you would receive £34 a share, and I still believe you will receive £34 a share, including Limerick.

The PROPRIETOR: What is Limerick to us? Let the directors give us £3 a share, and we will give it up altogether. Instead of £4 I will take £3. With respect to this money—the £4000—I think that clause has been sanctioned; but as to the other £500, I oppose it. And with respect to the Limerick affair, the sooner we are done with that the better. If the directors wish to carry it on on their own account, let them give us £3 a share, and I will give up mine. With regard to the services, I say that we have been dragged on from time to time; and as to the £500, I oppose that; and the Limerick affair I oppose. Whatever was sanctioned unanimously had better be given.

Mr. WILLIAMS: There are a few questions I want to ask. What is the meaning of the set of figures on the credit side? It should have appeared a loss, whereas the balance-sheet shows a profit; and I want to know about the law and parliamentary costs.

The SECRETARY: £2000 has been paid, and £3000 is owing.
The PROPRIETOR: Is it an asset?
The SECRETARY: It is not written off.
The PROPRIETOR: Then there is Cork Consumers Gas Company, £1135 9s. 11d.; and then Cork interest, £402 18s. 6d. It is on both sides.
The SECRETARY: No, it is not. It is in the general surplus, and you will have it some day.

Mr. STEPHENSON: The process has been this, we receive a certain sum from the Cork Consumers Company for interest. This has been kept in hand each half year, and the accounts credited with a portion of the interest from time to time. We have now come to a climax in the state of our affairs, and that will be settled up.

The CHAIRMAN: With respect to the law charges, we have this, signed by the auditors: "The auditors have passed the amounts of £1651 11s. 1d. and £878 1s. 6d., respectively due to Messrs. Gregory and Co., and Messrs. Dyson and Co., and they beg to express their opinion that these amounts should not be paid until they have been submitted to the usual taxation."
A PROPRIETOR: You have it down as an asset.
The SECRETARY: It is money spent.
The PROPRIETOR: Then there is insurance £1513 15s. 11d.
The SECRETARY: That is floating on the general assets of the company.

Mr. LYSLEY: I am much in the spirit of the gentleman who spoke before me. It cannot be expected that at the last meeting there should be perfect content shown at the disposal of a concern for much less than it was worth; but I believe the price we got was the result of previous mismanagement. There is to Mr. Sanders, in the allotment of £4000 paid by the Alliance to us, £2000. Now, Mr. Sanders has been described to us as manager and agent, and he goes off with the lion's share of the sum and gets £2000, and the remaining £2000 is to be subdivided among our officers here, whom the Alliance Company do not take. Now, I do not know whether I am correctly informed, but I believe I am, that Mr. Sanders, although he was our secretary and manager, was a director of several other companies in Dublin, and that he was an acting, moving man, so that in point of fact he would have had little time to attend to our concern, and I believe it is an indubitable fact that he had other companies to attend to; and I say, under those circumstances, that you gentlemen, the directors, were most culpable in allowing a man to take three or four different offices when he was receiving a sum or £700 a year for the management of our concern. I cannot understand what inertness to deal with a plain case could have actuated you. It seems to me, if I had a servant who had ceased to employ himself in my concern more than an hour or two a day, I should not have continued him, and I should have dismissed Mr. Sanders. Passing that by, I come to the question of the Limerick property which still remains, and I, for one, deprecate anything like a continuance of that property, yielding, as we see it does by those accounts, £2700 a year, with a board in London. It is preposterous, I should say, that the whole thing should be disposed of; and if the Alliance Company will not take our whole concern, which they ought to have been caused to do under the arrangement with them, I should think it is the duty of the directors to put the concern up by auction, and to sell it for what we can get. The value in that way will be most certainly obtained, because it is not so large a concern but that a private speculator could deal with it. There are plenty of contractors who would find ten times the money to purchase this; and I would have it put up by auction to fetch the highest price. Of course, I should put a limit; and I think then you would be in a position to say, "Gentlemen, we have so many pounds a share to divide," and the whole thing would be closed. But here we have a concern yielding £2700 a year, with a board in London, and that is entirely out of the question. I should be glad to ask of the directors what already has been done, and what is the intention they have of trying to dispose of the property.

Mr. WOOD: Perhaps you would allow me a few minutes to make a few remarks with reference to the Limerick property, and satisfy Mr. Lysley if I can. The fact of the matter is this, that we have spent at Limerick about £29,000; and after the meeting, when some of the gentlemen in the room did not wish to continue the Limerick property, some persons came forward to buy it, and offered us for our £29,000 only about £14,000, which would not give us 30s. I have not the slightest doubt myself that the Limerick property is worth between £30,000 and £40,000, but if you force that on the market no one will take it of you. I do not believe you can get a purchaser for it.

Mr. LYSLEY: Try it.

Mr. WOOD: In answer to Mr. Lysley's question—what did the directors propose doing with it?—at the last meeting I told you, and I tell you now, that our intention is to continue it with a staff, a very small one—a collector, an engineer, and a clerk—and we intend to have a gentleman here, with an office in London, at a cost of £100 a year. We are only doing it as a temporary measure till we find a proper market to sell our property for what it is worth. But if we cry "stinking fish" we are not likely to find a purchaser. Talk about business! That is not the way to do business, gentlemen. If what we say was merely confidentially brought before the shareholders, and if we kept what we said to ourselves, it would be a different thing; but when we are speaking against our own concern and that is to go forth to the public, I assure you we are not doing the best we can for our own interests. I represent a very large interest in this concern, and I honestly do say that I am sorry to have heard the observations made—"Sell it for what it will fetch, and force it on the market."

Mr. LYSLEY: No, no.

Mr. WOOD: I do not want to go on with it, but we ought to wait our time, and sell it when we can get a proper price for it.

Mr. LYSLEY: I really beg pardon, but I did not say we were to force it upon the market, or take what it would fetch. I said, we should put a reserve price upon it; and I object to those arguments, which amount only to this, that you are to sit on your stool, and wait until somebody comes and asks you to sell it. As for crying "stinking fish," it is nothing of the kind. You have a good concern, well worth the embarking in by capitalists with money; and I have no doubt, if honestly and straightforwardly put forward, you would get an adequate price, and so dispose of it. There is the corporation—I have heard of them; and there are plenty of other men who have a small capital of £30,000 or £40,000, and would look upon this concern as a source of paying 10 or 15 per cent., if well managed. There is no "stinking fish" to talk about. I say the thing is a good thing, and worthy of being put up to open competition, and I believe if it were done so, you would have a satisfactory bid, and you would close the concern at once.

Mr. STEPHENSON: It was not my intention to say anything on the question of Limerick, but after what has fallen from Mr. Lysley and Mr. Wood, I think it right, as a trustee acting for this company, that I should give you my views on the matter, more particularly as I differed at one time from the policy pursued and carried out by the board. I did hold my opinion at one time to sell the Limerick property, if possible, and close the transaction. I have agreed with Mr. Lysley in that respect. But, after the observations which have fallen from me on former meetings, I was written to by some of our officers at Limerick, and also by Mr. Tait, the mayor of Limerick, with reference to the disposal of the works to the Limerick Company; and I should like to mention this, because it differs somewhat from the statement, through inadvertence, made by Mr. Wood. As to the proposal by Mr. Tait, it was that a third company should be started in Limerick. As we were unwilling to sell to the corporation, and the corporation were unwilling to sell to us, the best thing to be done was that a third company should be started to purchase our company and the corporation works, and make a company that would be worked at a profit. I thought that a good proposition, and the proposition was to pay us half in shares and half in cash, and the corporation half in shares and half in cash.

Mr. WOOD: There was nothing about cash.

Mr. STEPHENSON: I will tell you the proposition has come to me. There was no proposition made to the board, and the proposition that came to me was that there should be a third company started, and that the United General should be paid for, half in cash and half in shares, and paid for the stocks in cash, and that the corporation should be paid half in shares and half in cash, and the stocks in cash. I thought that was a fair proposition, and I brought that proposition before the board; but I am sorry to say I had no seconder, and the matter fell through. At the same time, the policy of the board which now exists was advocated by Mr. Wood, and that was ultimately decided with the board, considering the fact that we have arranged with Mr. Ogg that the London management shall not exceed £100 per annum. I am not indisposed myself at the present moment to go with the policy of the board, and, at present, to continue the management of Limerick on that basis, because I do not think you can do anything better. I think it would be a preposterous idea to sell the works by auction. You would not get for those works anything like their cost if you put them up by auction. Therefore, you must really, I think, advocate the proposal to carry on the business till you find a purchaser.

A PROPRIETOR: It is improving.

Mr. STEPHENSON: Understand that I do not want to cry "stinking fish" about Limerick; but I did think that some good might come out of the proposal of Mr. Tait, the mayor.

A PROPRIETOR: What was the amount stated?

Mr. STEPHENSON: There was no amount stated. There was something said to the effect that he would give £14,000, but it was thought he would give £20,000. The idea I had floating in my mind was this, that a fair arrangement between the corporation and this company would be, that a third company should be started, and that both the corporation and ourselves should be bound to sell to the third company at a valuation, to be made by some independent party, and necessary capital to be found by the new company at Limerick; and that the corporation and ourselves were to be paid half in shares and half in cash. That was my idea of a fair and equitable basis; but, as I said before, the matter went no further.

Mr. GODFREY: I think it is imprudent to hawk our property. Property of that kind would not find a ready purchaser, and it would prejudice us if we were to put it up for sale by public auction, and bought it in again. In the opinions I have expressed, I have expressed myself adverse to the policy pursued by the board on many occasions; but, with regard to the Limerick business, I think the policy now indicated is a proper one—it does not prejudice us in the least, and leaves us open to an advantageous offer; and, in the meantime, the rental is increasing in Limerick, and the longer it is delayed we shall have a better property to dispose of. As to the offer of Mr. Stephenson, as mentioned, I am not suprised at the board refusing it. Our property cost £29,000, and the offer was about £14,000, half shares and half cash. We were to take half the value of our property, and only to receive one-fourth in cash, and leave the other in the hands of gentlemen who might mismanage it. In the Cork concern that has not been successful, and that induces us not to leave our property in other hands. I think the board has exercised a wise discretion in declining that offer. That offer being declined, if the parties were in earnest they could have made a more advantageous offer. I think the directors have exercised a wise discretion, and have not been guilty of any *laches* so far as that matter is concerned. With regard to "officers compensation," as you did me the honour of appointing me one of the shareholders to confer with the directors, perhaps you will allow me to express my opinion as to the question of compensation. With regard to Mr. Sanders, there were peculiar circumstances connected with him at the time the matter was in the hands of the committee. Some arrangement was come to by which Mr. Sanders was entitled to a part of the £4000. As to the general principle of compensating servants of the company, I differ *in toto* with those who say they have been paid salaries for twenty or thirty years, and are to be cast adrift. I think proprietors are bound in justice and honour to make compensation to those officers who are deprived of the means of livelihood by the cessation of the business. It is not a bankrupt concern. If it was a bankrupt concern, there would be no assets. And gentlemen have said it is altogether an unheard-of proceeding that you should have this consideration for the officers. I beg to remind them that in the case of the Agra and Masterman's Bank they made a stipulation that they should take over all the servants or compensate them in some manner, and that was a proposition that was acquiesced in as being creditable. In going through those items for the purpose of compensation, the committee had the £4000 to deal with, but they found that £4000 did not amount to what they considered sufficient to make bare compensation to the officers. I do not think it is a liberal compensation; we are doing, I am afraid, only bare justice. With regard to Mr. Graves, there are peculiar circumstances which entitle him to some consideration—not legally, perhaps—not even morally, perhaps—but out of pure kindness and liberality on the part of the proprietors. Having regard to the services of the other gentlemen, we have compensated him in the same ratio; but Mr. Graves has been in our service as book-keeper many years. As one of the auditors, I can testify to the admirable manner in which the books were kept; and he was, I think, a most valuable servant. He is incapacitated by ill health from getting a situation elsewhere. He would have been competent to continue in our service, and perform his duties, but in his present state of health no one would take him as a new clerk. He is incapacitated from going about to seek for another situation, and he is worse off than the other servants. I hope the shareholders will take his case kindly into their consideration. For my part, I am happy to support the proposition for increased compensation to Mr. Graves. Perhaps the better way would be, not to interfere with the report, that this increased remuneration should be put by way of a substantive resolution.

The CHAIRMAN: By way of rider?

Mr. GODFREY: Yes.

Mr. DOANE: I should like to refer to the statement of accounts. This £3300 is interest from the 29th of September to the 31st of December; then at our autumnal meeting we shall have the £3300 to divide, together with the profits of Limerick.

The CHAIRMAN: Liable to any slight deduction from Dublin.

Mr. STEPHENSON: Any liability that will come from Dublin will be a capital liability and we will pay it out of the assets of the company. The £3300 would be a balance towards profit and loss for the autumnal meeting.

Mr. DOANE: As there has been exception taken to the mode of compensation, I am sorry to hear it said that the committee found themselves precluded from dealing with the £4000. If you turn to the agreement you will find it is for the United Company to deal with it, and that the "Alliance" had nothing to do with it. If you look at the heads of the agreement, it is—"£4000 paid under the agreement with the Alliance Company to be applied under the 14th head by the United Company, at their discretion, in and towards making compensation to such as they think fit of their officers and servants who are not required by the amalgamated company." Therefore we should not have been fettered as to what we should pay Mr. Sanders. As to the others, for many years I can testify to the way in which our secretary has fulfilled his duties. He has been to Dublin and we all know that we have received benefits from his visits there. Our secretary has not only been an efficient secretary in London, but he has rendered important service in Ireland. With respect to Mr. Graves, I am sorry that this should have been a matter of discussion on the present occasion. I now pass to the question of annuities, and it appears to me that these pensions should have been brought before us. Here is one to Mrs. Gibbings and one to Mrs. Alder—one for £100 and the other £40.

The CHAIRMAN: The question was brought forward before the court, and settled by the proprietors. We looked back to see whether it was during the pleasure of the directors, but we saw it was not.

Mr. DOANE: How long ago was that?

The CHAIRMAN: A long time ago—ten years ago.

Mr. DOANE: I am glad you have put me right. I concur in the opinion Mr. Godfrey has expressed with respect to Limerick. I think he has stated the matter very truly. It is impossible for us to force a purchaser, but we must do the best we can to put the concern in the best position. I think the directors deserve our thanks for undertaking this management gratuitously and making all those arrangements, and I shall vote for the reception of the accounts and the report of the joint committee.

The CHAIRMAN: I will put the resolution that the report and accounts be received and adopted.

The motion having been carried,

The CHAIRMAN said: Will any gentleman propose a rider with regard to the increased compensation to Mr. Graves?

Mr. CROSSLAND: I will move that it be doubled.

Mr. SMYTHE: I beg to second that.

A PROPRIETOR: It was allotted that £400 should be given to our officers?

The CHAIRMAN: Yes.

The PROPRIETOR: A gentleman on my left thought we were not in a bankrupt condition, but we can only pay 13s. 4d. in the pound, and with all due respect to you——

The CHAIRMAN: Perhaps you will speak to the motion before the meeting.

The PROPRIETOR: I wish to do that. I think the £4000 is sufficient for the officers. Then there is a proposition to give £2000 to a gentleman who received £700 a year.

The CHAIRMAN: We have already passed that. What we have to deal with is the compensation to Mr. Graves.

The PROPRIETOR: I say distribute the £4000, but there should not be an increase of £300.

The CHAIRMAN: The accounts you have passed. You held up your hands.

The PROPRIETOR: No, no.

The CHAIRMAN: I put the resolution that the report and accounts be received and adopted, and you approved of that.

The PROPRIETOR: I have not.

The CHAIRMAN: It is merely as to the compensation to Mr. Graves. The question before the meeting is whether the additional £300 ought to be added to Mr. Graves's compensation.

The PROPRIETOR: I objected to it. We are bankrupts, and we cannot afford it. Have you ever found a firm in this position who could allow £2000 to their servants? I should advocate it where we are prosperous, but it is a different thing here.

The CHAIRMAN: I now put the resolution that the £300 to Mr. Graves be made £600.

The motion was carried.

The PROPRIETOR: It is no use attending these meetings.

The SECRETARY: Perhaps you will allow me to thank you for the liberal grant you have given me after 20 years service. I feel it very strongly, and am obliged to you.

The CHAIRMAN: That is all the business.

A PROPRIETOR: How soon will this be carried out?

The CHAIRMAN: As soon as we get the money.

Mr. PHILLIPS: Mr. Chairman, at our last meeting you stated that the directors had not received any portion of their fees for the last six months.

The CHAIRMAN: Not since the 29th of September.

Mr. PHILLIPS: It appears the board have had a large amount of trouble in conducting this business to a satisfactory termination, and I think the shareholders would be unwilling that the directors should not be remunerated for their services. I do not know whether any change has taken place.

The CHAIRMAN: Speaking for myself and the other directors, we have had rather more to do than before now.

Mr. PHILLIPS: I do not see on what principle the directors are refusing to take their fees.

The CHAIRMAN: We feel it would be more delicate to leave it to the proprietors.

Mr. PHILLIPS: I belive it originated from some observations that fell from you. You expressed some hesitation in taking your fees, but when gentlemen are actually employed as you have been, and have brought matters to this satisfactory conclusion, you ought to be paid. I beg to propose that, up to Lady-day ensuing the completion of the business and transfer of the shares, the board receive their usual remuneration.

Mr. SMYTHE: As one of the committee, I can only say that they have had more to do than they have had since the commencement of the concern. I shall second the motion with great pleasure.

Mr. WILLIAMS: I meant to propose this at the early part of the meeting, My own opinion is this—if you want good servants you must not ask them to do work for nothing. If we want our business done properly, we must pay them adequately. Everything must be attended to, and there is a great deal of work to be done, and we should not place ourselves in a proper position if we were not to ask the directors to accept their amount of salary up to the closing of the accounts on the 25th of March.

Mr. LYSLEY: I am afraid I shall appear in a niggardly point of view in saying that I do not think this is a matter that the directors should be remunerated for. The thing is sold and done. It is merely office work, and not for the directors.

The CHAIRMAN: We have had more to do than ever.

Mr. LYSLEY: Then I go further, and say you do not deserve it after such a bargain and such permissive management. I appear reluctantly in this character. I am aware it is unpopular, but it is my honest conviction, as I said.

The SECRETARY: The business will go on for the next six months, and cannot be conducted by myself. I cannot pay away £105,000 without consulting my board, and the duties will be of a very onerous character. I cannot do it myself. This board has now work enough to go through for the next six months.

Mr. LYSLEY: I think the remarks made by the secretary are valuable and in point, and might tend to conciliate in this matter, if, after March, we might not be told that there were duties at the Limerick works which required constant attention, leading on to an establishment commencing at £100 a year, and ending we know not where.

The CHAIRMAN: I can only say, as an honourable man, that we have done the work gratuitously, and are entirely in the hands of the shareholders.

Mr. PHILLIPS: This has been proposed by the proprietors, and endorsed by them, and I think it is not right for you to refuse the fees.

A PROPRIETOR: A great many of the shareholders have gone. We thought the business was done, and this should not be brought forward now. Although, as the secretary says, the duties of the directors are onerous, I do not think, without notice, we should vote for this.

Mr. LYSLEY: There would be no difficulty in delaying it till September.

The CHAIRMAN: Certainly not. We have no feeling on this side of the table.

Mr. LYSLEY: It would not be proper to take a vote on this matter in this state of the meeting, and it ought not to be put.

A PROPRIETOR: After a great many proprietors have gone, a gentleman starts up and makes a motion. Let it be brought forward at another meeting.

The CHAIRMAN: After the observations that have been made, I am quite sure I am but speaking the feelings of my brother directors, some of whom have gone, when I say we should rather that this question be deferred. Under the circumstances, we would rather not take any remuneration at a meeting when, as it has been said, a great number of those that were present have gone. It was not for us to bring forward any motion; and we are willing to do the work gratuitously if you wish it.

Mr. PHILLIPS: Will you allow me a word of explanation. I noticed that £300 for fees appeared in the accounts, and I recollected that the chairman had said that the directors did not wish to have any remuneration at all.

I asked about this £300, and then came the explanation that it had not been passed in the accounts, and the board had decided not to take it. Under those circumstances I hurriedly came in and made the motion.

A PROPRIETOR: You can bring forward this at the next meeting.

Mr. PHILLIPS: Yes.

The proceedings then terminated.

OTTOMAN GAS COMPANY, LIMITED.

The Half-Yearly Ordinary Meeting of the Shareholders of this Company was held at the London Tavern, on Monday, March 11—S. A. BECK, Esq., in the chair.

Mr. ARTHUR J. KING (the secretary) read the notice convening the meeting, and the following report and statement of accounts was then presented:—

Gentlemen,—Your directors herewith present the audited statement of accounts for the past half year.

The shareholders are already aware, from the circular of August 7th and the report of Sept. 5, 1866, that the directors have experienced great difficulty and embarrassment in regard to the public lighting; and the manager being unable, on the one hand, to get payment of the amount due, and being required, on the other, to make considerable abatement from the contract price, the directors gave orders to cease lighting, and informed the proprietors that it was not their intention to resume until the arrears due to the company should be discharged, or until some satisfactory arrangement should be made.

His excellency the governor has manifested the most friendly disposition towards the company, and evinced his earnest desire to see the public lighting resumed on a satisfactory basis. To this end he requested Mr. Gandon to relight for one month under his own personal guarantee, and promised, in the course of the month, to aid, in every possible way, the collection of the arrears, and to use all his influence to bring about an adjustment of the points at issue; in obedience to this request, and furnished with this guarantee, the manager resumed lighting the city on the 8th of November.

The public lighting has, therefore, been in partial operation for only seven weeks during the half year; and as this department has hitherto constituted more than half of the company's business, a considerable reduction on the half year's rental must of course be expected. The accounts show accordingly a gross rental of £1634 10s. 7d. against £2185 19s. 11d. for the previous half year. The profit on this rental being little over £500, does not suffice to cover the working expenses, and the result is, therefore, an adverse balance of £64 12s. on the half year's working.

The month's interval was employed in earnest efforts to come to some understand, and on the 13th of December terms were agreed on with the Gas Commission, the company consenting to some reduction of the former rate, and the commission adopting a new mode of assessment. This contract is at the rate of 10 piastres per pic of frontage; and at this price the company can still manufacture gas at a profit, provided only they get duly paid for it. But the directors must still express their disappointment at the slow progress made in discharging the arrears, notwithstanding the promises made by the governor and consuls to enforce payment, and the sacrifices made by the company to secure it.

The private lighting continues to make satisfactory progress; the amount for the half year being £1397, against £1048 of the previous account, and £653 for the corresponding period of 1865; and, in fact, the private lighting alone is now about equal to the public and private lighting together a year ago, which is the most satisfactory feature the directors have to report.

The directors who should retire by rotation are John Bethell, Esq., and Dr. Fraser. The directors regret, however, to report the recent decease of Mr. Bethell. Dr. Fraser, being eligible, offers himself for re-election. The two auditors, E. P. Rowsell, Esq., and George Allin, Esq., also retire, but, being eligible, offer themselves for re-election.

Dr. — *Balance-Sheet, December* 31, 1866. — *Cr.*

To Capital			£50,000	0	0	By Plant	£40,227 1 4
Debentures			13,450	0	0	Concession and preliminary expenses	16,888 9 10
Sundry creditors			2,045	7	3	Stocks	3,876 2 11
						Amount owing for public lights	2,310 11 5
						Sundry debtors	1,340 3 8
						Cash	639 1 5
						Office furniture	124 10 3
						Profit and loss—	
						Balance from last account	£ 24 14 3
						Ditto from account, Dec. 31, 1866	64 12 0
							89 6 5
			£65,495	7	3		£65,495 7 3

Dr. — *Profit and Loss Account, December* 31, 1866. — *Cr.*

To Cost of coals		£ 746	3	7		By Gas-rentals—			
Wages and proportion of general expenses at Smyrna		639	3	5		General consumers	£1,397	6	6
		£1,385	7	0		Public lights	237	4	1
Directors fees						Coke and tar	253	15	6
Interest account		26	3	0			£1,888	6	1
Ditto on debentures		367	10	0		Profit on chandeliers, fittings, meters, &c.	£ 281	5	2
Exchange account		19	1	11		Less proportion of salaries and Smyrna expenses	127	7	11
Bad debts and allowances		17	4	11			153	17	3
Depreciation of meters at rental		20	18	0		Transfer fees	0	12	6
Law costs		11	4	4		Profit and loss account	64	12	0
Auditor (Smyrna)		25	0	0					
Rent, salaries, printing, stationery, and office expenses, London		234	18	8					
		£2,107	7	10			£2,107	7	10

The CHAIRMAN: Gentlemen, it now devolves upon me to call your attention to the report which we present to you to-day, and also to the report of the committee of investigation, which has been circulated amongst you. With respect to our report this half year, I can add nothing to the statements which we have made to you. The difficulty we have in obtaining payment for the public lights is almost insurmountable. We have taken every means we possibly could to press upon the authorities, as a matter of honesty and of policy, their duty to pay for them. We cut off the supply, and refused to light the lamps again. The Pasha himself then volunteered that if we would relight them for a time he would guarantee the payment. We accordingly relighted them for a short time, and as we could not get payment for the amount due, we called upon the Pasha to fulfil his guarantee. He said, "We have just arranged to-day for a new mode of payment, and therefore you cannot think of asking me." In fact, they try to evade payment in every way they can devise. The only good feature in our affairs since we last met is the increase in the private lighting, which, I think, as far as it goes, is satisfactory, and I hope in time we shall find this a paying concern. More than that I cannot say. The next subject I have to bring before you is one which I mention with great regret. I was not here the last half-yearly meeting, and when I returned to town I was surprised that a committee of investigation had been appointed—in fact, to try the directors. There was not the slightest complaint made of any particular item in the accounts, there was no complaint made of bad management, and yet a committee of shareholders was appointed "to confer with the directors." The committee attended the board at our first meeting, but no conference took place. All that we did was to give into their hands all books and papers, and leave them to judge for themselves. I must confess, therefore, I was very much astonished at the report when I saw it. As I read it I was filled with amusement, surprise, and indignation; amusement at the terms in which it is drawn, surprise at the boldness of the statements it contained, and indignation at the inculpation of the directors, without an attempt being made to put a finger on a single instance of bad management, unless it be in reference to the question of "wages." On that point their ignorance is extraordinary, for if it is not ignorance it is malice, and nothing else, as I will point out presently. But, notwithstanding my indignation, it certainly is a matter of satisfaction that, with all their feelings against the directors, they do not pretend to say there is any bad management, nor do they in any one instance put their finger upon an item of expenditure wrongly incurred. No one more than myself is ready to admit the right of shareholders to inquire in the conduct of directors. It is a duty which I myself exercise in other companies with which I am connected, and I fully recognize the same right of the shareholders here. But at the same time, I think in making these inquiries shareholders are bound to come to it with an honest desire to see really how affairs stand, of examining the accounts fairly, and if they find the directors have done their duty to say so, and not to make vague charges against a body of gentlemen who take a great deal of trouble about the management of their affairs, without the slightest foundation. Now let us see whether the gentlemen who have undertaken to overhaul and to censure our conduct are better judges of how a company of this sort ought to be managed than we are. It is always difficult to speak of oneself, but as I have been a director of one of the largest gas companies in London—the largest but one in the world—18 years, and the chairman of that company for, I think, 12 years, and been in the habit of visiting the works three days a week during that period, I think I ought to know something on the subject. Still I believe I have much to learn; but these gentlemen who presume to censure us jump, I suppose instinctively, into the knowledge of how a gas company should be managed. My friend on my left (the Hon. Richard Howe Brown) is deputy-chairman of the Chartered Company, of which I am the chairman; my friend on my right (Mr. Horner) is deputy-chairman of the Phœnix Gas Company—a man who has the whole subject at his fingers ends. Mr. Bethel, who was a director of this company, though unfortunately he is now dead, had an intimate knowledge of all questions relating to the management of a company, and the other directors are gentlemen of experience and ability, more deserving, I believe, of your confidence on all such questions than four or five gentlemen who, I venture to say, do not know a stoke-hole from a retort, as far as gas-making is concerned. I think I can show you that they know nothing at all about gas-making. Let us go through their report paragraph by paragraph, and see what it is they suggest for your consideration. In the first paragraph they say: "We have held several meetings, and have inquired into the affairs of the company, which, as an undertaking, cannot be said to have realized the expectations held forth in the original prospectus." I am sorry to say it has not; but we, the directors, have been deceived as much as any other gentlemen. I am sure I thought this would be a paying concern, and I regret to find that it is not so at present. Still I do not cry like a child over my disappointment, but I hope we shall get on better in time. It certainly is no fault of the directors that it has not realized the expectations which the committee entertained of it. That committee came into the concern with all this knowledge; we, unfortunately, who are the original proprietors, bought our shares at par. There is not a single figure they have given which has not been before the proprietors at every meeting, and with exception of Mr. Van Voorst, who is an original shareholder, the members of the committee have had the good fortune to buy their shares at less than par. They say: "At our request the directors permitted the secretary to attend the meetings of the committee, for the purpose of affording information and producing books and papers." The board told the gentlemen when they attended us they should have every information and every private letter from our agent in Smyrna, and that not a single document should be withheld. I believe they did see everything. "Herewith we furnish a full statement of the receipts and expenditure of the company, from the commencement, June 1, 1862, to June 30, 1866, and we commend it to your careful perusal." As if a report had not been before the proprietors every half year, showing them exactly how things were going on. "You will perceive that, though it was announced in the original prospectus that £50,000 would be sufficient capital, the sum of £70,500 has been spent without returning any dividend to the shareholders." I never read such a statement in my life. The £50,000 was the original capital raised. You will hardly believe it when I tell you that the £70,500 includes every item of cash received, including the profits realized since the commencement of operations. It seems perfectly childish to make such a statement as the committee have done, and how any men of business could do so I am at a loss to understand. They have taken every item received, and have not given us credit for a single shilling paid. Then they say: "By furnishing you with so full a financial statement, we are, to a certain extent, relieved of the duty of commenting thereon. We may briefly refer to two items, and state, as our opinion, that

too much money has been spent upon 'plant' and 'fees, salaries, and wages.' There has been a tendency generally to work this small company as if it were a large one." Let us look at these items, and see what ground the allegations of the committee rest upon: They say too much money has been spent on plant. The amount spent on plant is £37,000, including everything except the land. But we had estimates prepared, which were brought before the original company, and everything has been done within those estimates. I have no doubt these men with very small minds who talk about our working "this small company as if it were a large one," would think that £37,000 was a very large sum for plant. I know that in the case of the Chartered Company, in London, it has cost us three times as much as it otherwise would have done because we did not spend enough money on the mains originally. It is the worst economy possible to lay out too sparingly at first. We started in the Ottoman Company to light a city with 180,000 inhabitants, and it would have been absurd to lay down 3, 4, and 5-inch mains. We looked forward to a large consumption of gas, and eventually it will come to that, I have no doubt. The great expense of laying mains is labour, and the difference of cost for labour between laying large or small mains is comparatively trifling, as every one knows who knows anything at all about gas-works. And I say again, it is the greatest mistake possible to start gas-works simply adequate to the wants of the present day, and to provide for lighting a few streets when you may have to light a large town. The next items commented upon are—"fees, salaries, wages." The directors fees, £2050, you may fairly think is a large item in such a concern; but these have been stopped for a year and a half. The others fees are those of the auditors; but this is a question for the shareholders themselves. In "salaries" is included salaries in London. For the four years, salaries amount to £1229, or rather over £300 a year. I can only say this, that I think we are most fortunate in not having more than that to pay. We have had two secretaries, Mr. Home and Mr. King—gentlemen who have means of their own, but wanted some employment, and were satisfied with small salaries. I say this is most fortunate, for whether the concern produced £1000 or £5000 a year, you must have a certain staff to conduct your affairs, and you must pay those whom you employ. With respect to the salaries at Smyrna, you cannot get men to go there on the same wages as they would receive at home. All our common workmen receive far higher wages there than they would do here; we are obliged to give it, and some have come back because we did not pay them more. This item amounts to £1386. The next item is "wages." It is incredible that such an item should be put down in this way. For the four years it amounts to £3448 10s. 7d., and you will hardly believe that out of that sum no less than £1389 has been actually received back by the company as wages on chandeliers and fittings which have yielded us a profit. Surely these gentlemen must have known this. If they did not they were grossly ignorant of their business; if they did know it, they certainly have not stated the honest truth, or they would have given credit for the amount. It also includes the sum of £259 19s. 11d. for lamplighters. If we light the public lamps we must have lamplighters, and must pay them, and therefore the only remaining sum under this head is the amount of wages upon the works, £1833 1s. 9d. This, for the period the works have been in operation, is about £450 a year; and yet "there has been a tendency generally to work this small company as if it were a large one." It is really laughable to read such statements. Great and small are comparative terms. A small shopkeeper, who earns a few shillings a day, regards the man who spends £1000 a year as an extravagant fellow. But it is absurd to talk about working this as a large company. Why, my own company spend more in one week upon this item than the Ottoman Company have spent in the whole four years. "In the original prospectus reference was made to carefully prepared estimates, as showing a probable dividend of from 12 to 15 per cent. The data, however, whereon these estimates were based, would appear to have been furnished by the *concessionaire*." Where they got this fact from I am at a loss to know. I believe the estimates were made by our original engineer, Mr. Lowe, upon statements received from different parties, and from his knowledge of what a city with a certain number of inhabitants would require. "It was also stated that the concession contained clauses for the protection of the company's interests." So it did, as far as the establishment of the company and the creation of a monopoly went. "No provision, however, was made for the collection of the rate, or the enforcement of its payment." I believe it is a thing unheard of for an Imperial Firman to regulate a municipal rate, and when in self-defence we cut off the lights, the Commission talked of our having forfeited our concession. Mr. Yorke, who knew Lord Stanley, applied to him and got a letter to our ambassador at Constantinople to protect our works. I happened to know an *attaché* of the Turkish Embassy here, and I asked him what course we could take to get our money. He said he could not give us any advice, for that in trying to raise a rate for sanitary purposes it has caused an insurrection in the town. I also had an intimate friend in the consul at Smyrna, and I wrote him to look after our interests. So that not one single step has been left untried, or one stone unturned to protect, as far as possible, your affairs from injury. "The half-yearly reports are, as a rule, somewhat too highly coloured, and the facts and anticipations dwelt upon therein are not always well grounded. The reports of Sept. 11, 1863; Aug. 10, 1864; March 10, 1865; Sept. 2, 1865; and March 3, 1866; are all more or less open to this objection." I should like these gentlemen to point out any one item which warrants this statement. All these reports have been before the shareholders at their meetings, and no objections have been taken to them, and I, as chairman of the company, have been very careful about making any statements which would induce parties to be too sanguine. I challenge any one to point out in any one of these reports a single statement which will justify this accusation. Then they go on: "A careful consideration of the consulting engineer's reports leads us to the conclusion that the works at Smyrna have not been managed so economically as they might have been in respect of the manufacture of gas. The leakage has been great, and the amount of gas produced per ton of coal has been very variable, and frequently low in quantity. This should not result from the state of the plant, which, in our opinion, has been built in a very expensive manner, and on too large a scale for the requirements of the company. Messrs. Laidlaw and Son have been paid some £25,000 for building the gas-works, which *ought to be* perfect." Now, what is the meaning of this? We take our engineer's reports, and we find he frequently remarks that the quantity of gas per ton of coal is not so much as it ought to be. But that is a thing which happens to us in England also. You will probably be astonished when I tell you that at one of our stations in London we were at one time only making about 8500 cubic feet of gas per ton of coal. And why? Because the coals came in wet from the ships; and there were other causes which had led to the deterioration of their quality. But do these gentlemen pretend to say for a moment that we have passed this over? If they looked at our letters they would find that hardly a week passes but we write to our superintendent calling his attention to it. We cannot help the matter, we can only do our duty by urging him to look after it. With respect to leakage, there is always a much greater proportion where the consumption of gas is small than where it is large. If all the retorts had been at work, and all the mains full, the leakage would be but very little more than it is now. Then again, in small works of this kind, you are obliged to light up now and then an extra bed of retorts, perhaps only half a bed. When done with, these retorts cool down, the crevices open, and it is some time before the leakage is stopped. But it is a thing we cannot help; the only question is, whether we as a board have done our duty in calling the superintendent's attention to it. "The immediate cause of the present dead-lock in the affairs of the company has been a misunderstanding between the authorities and the company respecting the rate for public lights, its legality being questioned, and payment refused in most instances. After a careful study of the question, we are of opinion that this difficulty mainly has resulted:—1. From the stipulations of the concession not having been strictly observed, and the consent of the inhabitants, as well as the governing body, obtained to the assessment.—2. From Mr. Gandon being too eager to push forward the public lighting, and, though knowing that no definite time or mode of payment had been fixed, continuing the erection of the lamps.—3. From there having been no provision in the concession for the collection of the public rate, and the enforcement of its payment.—4. From the authorities taking unfair advantage of these oversights and errors.—5. From the company not being represented influentially at Smyrna, a simple manager not carrying sufficient weight with Orientals." We will take these items *seriatim*. "There has been a misunderstanding between the authorities and the company." I think there has been no misunderstanding with the authorities. The Pasha is the only public authority, and he has done everything he possibly could to obtain the money for us. The legality of our claim has never been questioned, and the only foundation for this statement is, that Mr. Wilkin, a member of the Emlak, states that the price for the public lights could be considered as legally settled only after obtaining the consent of the inhabitants. I should like to know how we could get their consent. The Emlak Commission, we were informed, were the authority to settle this question. They agreed to certain terms, and we undertook the lighting of the lamps upon those terms. But when they are called upon to pay, they turn round and refuse to do so. And it was only then that the question of the legality of the arrangement was raised. Mr. Roussi, our legal adviser, however, says it is a perfectly valid contract, and cannot be called in question. But then it comes back to this—what are you to do? If these men will not pay, how are you to enforce payment? You can only cut off the gas, and refuse to light the lamps again. The committee say that the cause of the difficulty has resulted from the stipulations of the concession not having been strictly observed. All I can say is, we have strictly observed our part.

The SECRETARY: The Gas Commission have admitted the legality of the contract, although they at first disputed it.

The CHAIRMAN: The committee then say that Mr. Gandon was too eager to push forward the public lighting. I do not agree in that statement. I say he did not push it forward; it was a considerable time before he agreed to do it. Our agreement was to light 500 lamps, but the highest number we have lighted is 353, so there has been no undue haste in the matter. They say there is no provision in the concession for collecting the rate, Such a thing, I believe, was never heard of in Turkey. I quite admit that the authorities have taken an unfair advantage, not of "oversights and errors," but of a determination not to pay for what they have had. With reference to the fifth cause alleged—the company not being influentially represented at Smyrna—it seems rather remarkable because, I suppose, the knowledge these gentlemen possess of the Oriental race is gathered from what they have seen of Turks in the City of London. But admitting they are right, I believe the only way the Turks have of obtaining payment is to knock the person down who owes them the money, and bastinado him. You will recollect, gentlemen, that in this country we were without funds, and the directors, in addition to the anxiety and trouble the affairs of the company entailed upon them, had the honour of guaranteeing the bankers the sums of money necessary to be raised from time to time. The committee forget to state that fact, and this, amongst other things, makes one look at the *animus* with which this report is drawn up. They go on to say: "Feeling that, though Mr. Gandon might be an efficient manager of gas-works, he was not equal to the position of representing the company in a controversy with the Pasha and Emlak Commission, the more especially as he had been mixed up with the dispute from the beginning, we addressed a letter to the directors on October 15, commending to their serious consideration the advisability of immediately securing the services of some gentleman to specially represent the interests of the company during the negotiations respecting the public rate and its collection." In answer to that, I can only say I entirely and utterly disagree with the committee; and, gentlemen, you have the evidence in your own hands. A pamphlet was published some months ago, and sent round to every proprietor, showing the correspondence between Mr. Gandon and the Pasha. I need only call your attention to that correspondence as a proof of Mr. Gandon's fitness for his duty. For my own part, I never saw abler letters written, and it is astonishing to me that he was able to hold his position in the way he did. To give you the best evidence of his mode of dealing with business is, I think, to state the fact that the Pasha has always treated him with the greatest respect, and is now trying all he can to get our money for us. But supposing we were wrong in that, who was to be the party to take Mr. Gandon's place? Perhaps Mr. Oxenham would like to have gone, and he may think he would have great influence with the Orientals. If so, I can only assure him we should be very happy to pay him a handsome commission to do so. "A reply was received intimating that something should be done in the matter, but up to the present time the negotiations still remain in the hands of Mr. Gandon, and the question of public lighting still remains unsettled." I never thought of taking it into consideration; it was for the shareholders to say whether they chose to pay any other gentleman to undertake this management of the Orientals. "It is to be regretted that the matter has been allowed to drag on for so long. The public lighting should have been stopped when it was found that payment could not be obtained. The arrears would then have been small in amount, and the question would have been settled long ere this." That is altogether a gratuitous assertion. As to when we ought to have taken the step we did, we were of course to judge of the expediency. We were bound to light the lamps for some time; we were bound to give them every opportunity of seeing whether they could collect the tax. The tax is raised upon the frontage of every house, and there were disputes as to how much ought to be paid. We could not interfere in the matter, we could only wait, and hope that ultimately we should get a settlement. My own impression, I confess, was that we ought to have

cut off the gas three or four months before, but Mr. Gandon said the Pasha was doing all he could to get the money, so that we went on hoping against hope. We did cut the gas off at last, but that step did not lead to the bringing forth of much money, and there is still a sum of £2000 owing to us. The gentleman there to whom I had an introduction, through a private friend, wrote me to say that we did wrong in cutting off the gas at all, and that it was a mistake on our part. Perhaps, however, he did not understand Orientals so well as the gentlemen of this committee. "It is reported by the manager at Smyrna, that it has been discovered recently that the rate assessed for the public lights by the Emlak Commission, will not, when collected, come up to the agreed price per lamp by about 10 per cent. Moreover, he states that 10 per cent. will have to be deducted for bad debts, and 10 per cent. for expenses of collection, and that the public lighting will yield little or no profit." What that means is this: The Emlak Commission assessed the tax upon so much frontage for each house, but when they came to go into the particulars it was found that the amount assessed, according to their mode of calculation, did not come up to the £2000 they owed us, but only to about £1800. But that had nothing to do with us—it was their mistake. Then they wanted a reduction, and we said we should be glad to offer them a handsome commission to send the money over to this country. "It is unfortunate that the company's funds should have been spent in too lavish a manner, and, consequently, that the interest on a round sum raised in addition to the capital should have to be provided for. We do not think the opening at Smyrna so good as represented in the prospectus and reports, but still probably sufficient business could be done to yield a fair dividend on the original capital." Well, we hope so too. "Though we cannot hold out to the shareholders any hope of their receiving a moderate dividend for some time to come, still we think that good management may yet go far to atone for past errors of judgment." As I said before, for gentlemen, who really do not know a stoke-hole from a retort, to talk to us in this way about the management of the works is a great piece of presumption. I can say no more. "Turning from the past to the future, we have to state that, in our opinion, rigid economy, and a severe supervision of the expenditure, will be necessary to place the company in a sound position." But do they point out a single item in which that "rigid economy" has not been observed? Do they point to a single expense, except that incurred for wages, which I have already shown was properly incurred, to which even they can take objection? "In reference to the directors, we would recommend that their number be reduced to five, that no fees be received by them till a dividend out of profits of at least 3 per cent. has been paid to the shareholders, that they forego the sum of £700 (unpaid fees) for which they are entered as creditors on the books of the company, and that when they do receive fees, as per paragraph 2, the sum per annum do not exceed £550 (being at the rate of £100 each for four directors and £150 for the chairman)." A very cool recommendation, I admit, that we are to do your work, and advance money to keep your affairs going, and then to be abused and receive no pay. But we have complied with the recommendation, as, during the last year and a half, we have not received one penny. With respect to the reduction of the directors to five, one of our number is unfortunately dead, and I offered my resignation this time last year, and it was only at the earnest request of the shareholders then present that I consented to remain on the board. I felt that a great many friends had come into the concern because of my name, and, unfortunately, without asking me, for I never recommended any one to join it, and therefore I was anxious to do all I could to get the company out of its difficulties. But it is no honour to me to be chairman of a small company like this; there is neither honour nor credit to be got out of it, and certainly no profit, so that I can have no wish to retain my seat to be badgered here half year after half year about our bad management, without their being the slightest foundation for it. My seat is, therefore, at your service. If we are to sit here and do your work, and find money for the undertaking, I think we have a right to ask that we may be saved from such reflections as are contained in this report. "We think that the company should be represented at Smyrna by a resident director, if possible (in addition to the manager of the works). Failing this, three or four leading merchants or brokers might be induced to act as a board of supervision, to assist the manager with advice, to take a kindly interest in the affairs of the company, and to strengthen its position on the spot." Nobody has the slightest objection to that. We have written to several parties to ask them to represent us, but it is not every person who can do it; it must be a person who understands the course of English business as well as the affairs of Smyrna, and you will recollect we have no shareholders there. Then they say: "The gas manufacture should be closely watched. If the carbonization be good and the leakage small, money will be saved that up to the present time has been lost." Certainly a very wonderful discovery to make, only one would suppose they were talking to children in making such a statement. They then say that the European quarter of Smyrna should be thoroughly worked and lighted up before operations are extended to outside places. I think this statement is made because among the correspondence they found a letter from Mr. Gandon saying he had had an application to light up one of the suburbs, in which the merchants reside, about four miles from Smyrna. Of course if we could have got the lighting it would be a good thing, but we found that we could not get the persons residing there to bind themselves to take the light if we laid down the mains, and so we gave it up. Then they tell us that no new concession should attract our attention, that the assessment for the public lamps must be revised, and that touching the dispute with the authorities, the matter ought to be taken out of the hands of Mr. Gandon. Gentlemen, I must leave the question in your hands. I can only repeat my opinion that this report, intended to injure the directors, can have had no effect except to injure the position of the company. Who will come forward and buy shares or lend money upon debentures with such a report before them? We know the untruth of it, but the outside world does not. As far as the board is concerned, it has passed harmlessly over our heads; but as far as the company is concerned, it is a most unfortunate document.

Mr. HORNER (deputy-chairman) seconded the adoption of the directors report.

Mr. WINSOR, a member of the committee, said the chairman was quite mistaken in supposing there was the slightest *animus* against the directors. There was one unfortunate thing about the appointment of the committee —viz., that the resolution appointing them was written afterwards. He agreed to serve upon a committee of investigation, and was quite surprised afterwards to learn the terms of the resolution. This report was not drawn up against the directors, and he thought the chairman in his remarks had been very hard upon the committee. There was one great fallacy in the calculations upon which the works of the company were founded, and that was with reference to the population of Smyrna. It was said that works were required to supply a city with a population of 180,000. From all he heard he had reason to believe that a very large proportion of the population would never require gas. The committee had nothing to say against Mr. Gandon, and did not ask that he should be superseded, but that some one should be sent to his assistance so as to get the company out of the present dead-lock. As to the reports of the company being too highly coloured, if he had half an hour to do it in he could show the truth of that statement. The committee had drawn up their report most carefully, and to the best of their ability, and he did not think the remarks of the chairman at all met the statements it contained.

Mr. KNIGHT said he happened to be that member of the committee of whom it was said at the end of the report that he had been unable to attend more than the first two meetings. He believed the proceedings of the committee were not dictated by any desire to benefit the company, and that the only effect of these proceedings was to damage the undertaking in the estimation of the public. When he attended their first meeting he fully expected that Mr. Oxenham, who moved for its appointment, would be prepared to point out some definite course to be adopted. He found, however, that that gentleman was quite at sea, without a compass or a rudder, and as he believed no good could result from the deliberations of the committee, he determined, after the second meeting, to have nothing more to do with it. The speaker commented at some length, and amidst considerable interruption, upon the course of action taken by the committee, and concluded by expressing a hope that an end would now be put to an agitation which was so groundless and so prejudicial to the interests of the shareholders. They were bound to do all in their power to strengthen, and not to weaken the hands of the directors. He believed that if they turned a deaf ear to such rumours as had been circulated, and endeavoured to work harmoniously together, the ultimate success of the company would not be much below their original anticipations.

The motion for the adoption of the report of the directors was then put and carried.

The Hon. H. BROWNE, announced his intention of resigning his seat at the board, not, as he said, from any want of confidence in the concern, but because he had no time to attend to the duties of a director. Before, however, he took that step, he wished to propose a resolution for the adoption of the meeting, concurring as he did in the remarks made by the chairman as to the damaging effect of the agitation which had been got up against the board, and more especialty of the circulation of such a report as had been drawn up by the committee upon utterly insufficient data, and published by them to the world through the columes of the *Times*. The resolution was in these terms—"That in the opinion of this meeting the report of the committee of shareholders which has been circulated among the proprietors is based on wrong data, and is calculated to injure the general interests of the company, and to throw discredit upon the undertaking."

Dr. FRANCIS seconded the resolution.

Mr. COLE, as a member of the committee, said he had no doubt if they all worked harmoniously they would get on better, and he hoped their proceedings in future would be more satisfactory. He thought the policy of the directors in the past had been vacillating, and that the company were not properly represented at Smyrna.

The CHAIRMAN defended the board against the charge of vacillation, and said, as far as the better representation of the company was concerned, the directors were as anxious for it as any one could be, but the difficulty was—Who was to undertake it?

Mr. OXENHAM said, when he entered the company he certainly found that he had been misled as to its prospects, and therefore he felt it his duty to adopt the course he had pursued. He had no animosity towards the directors, and deeply regretted that the chairman had spoken of the proceedings of the committee in the way he had done.

Mr. LEMON said he had no sympathy with many of the statements in the report, but he objected to the term "wrong data" in the resolution, as that would be impugning the correctness of their own books. He should move, as an amendment—"That the report of the committee be received," and there left.

Mr. WINSOR thought that in the interests of the company the chairman might second the reception of the report. He hoped the directors would accept it in a kind and friendly spirit.

The CHAIRMAN said he might be very weak, but he was not going to write himself down an ass.

Mr. HORNER did not hesitate to say that for any one to get up and ask a member of the board to second the reception of the report was the most insolent thing he had ever heard in his life.

The Hon. H. BROWNE said to meet the view of Mr. Lemon he would alter the word "data" in his resolution to "inferences."

Mr. HORNER severely condemned the publication of the report of the committee in the public newspapers, and hoped the shareholders at large would never endorse the statements by voting for its reception.

The amendment was not seconded, and on the motion of the Hon. H. Browne being put to the vote it was carried, with two dissentients.

Dr. Fraser, the retiring director, and Messrs. Rowsell and Allin, the retiring auditors, were severally re-elected, and the remuneration of the latter was fixed at ten guineas each per annum.

On the motion of Mr. KNIGHT, seconded by Mr. COLES, a vote of thanks to the chairman and directors was adopted.

The CHAIRMAN acknowledged the vote, and thanked the proprietors generally for the confidence reposed in the board. He believed they had done their duty to the utmost of their ability in the past, and he had only to assure the meeting that no effort would be wanting on their part in the future, to advance the interests of the undertaking.

THE WATER SUPPLY QUESTION AT CANTERBURY.

On Thursday evening last the General Purposes Committee of the Town Council for carrying out the provisions of the Local Government Act met to consider an offer made by the Canterbury Gas and Water Company to sell to the local board the plant and rights of the water supply for the sum of £7000. The meeting was under the presidency of the MAYOR, and as the subject is one of great importance, there was a full attendance of members of the council.

The TOWN CLERK having read the offer made by the gas and water company,

Alderman BRENT raised the question whether members of the court being shareholders or directors in the gas and water company could vote on the subject.

Mr. PILCHER thought that shareholders or others having an interest in the gas company could vote, because the water supply was quite a separate undertaking.

Alderman BRENT thought the two undertakings were mixed up together. For instance, the cost of obtaining increased powers by the water company came out of the profits arising from the gas supply.

The TOWN-CLERK said that the Canterbury Gas and Water Company

was a joint-stock concern, and, consequently, those members of the council having an interest in it could not exercise the power of voting on the question before the meeting without the sanction of the Secretary of State.

Mr. COOLEY, without comment, proposed that the offer of the gas and water company be declined.

Alderman MASTERS seconded this, and on being put to the meeting it was carried *nem dis.*

Mr. PILCHER reminded the court that it was necessary to take some action in the matter of water supply, for the operations of the Local Government Act were at a standstill pending the settlement of the question. Surely now they had met to determine the course to be adopted some course defining ultimate action ought to be pursued, and to this end he should move that the gas and water company be called upon by the board to provide an adequate supply of water for the city.

Alderman BRENT, said that whilst holding an adequate supply of water in a city like Canterbury to be of primary importance, he had always contended it should be a matter for others than the Town Council to carry out, objecting as he did to see a municipal body placed in the position of a public company. He was glad, therefore, that the council had declined the offer of the gas and water company. The price asked was exorbitant, for really the company had nothing to dispose of but the privilege of supplying the citizens with water. The duty of the local board, under these circumstances, was to lend their aid to the existing company to carry out the increased powers granted them, and he therefore begged to move that a resolution be forwarded from that board to the gas and water company, to the effect that, whilst declining the offer to purchase the water-works, the local board are impressed with the importance of the city being supplied with an adequate supply of water, and will use every proper means to assist the gas and water company in carrying this out.

Alderman BRENT's motion having been seconded, was submitted in the form of an amendment, and carried.

Mr. PILCHER expressed his conviction that, with a view to bring the matter to an issue, the gas and water company should be asked to fulfil the conditions of their late increased powers.

To this several members dissented, arguing that the suggested course might form a plan for future action.

The town-clerk having been directed to forward copies of the resolutions to the gas and water company, the proceedings terminated.

Our local correspondent informs us that the result of the above meeting must be regarded in the light of another step on the part of a section in the council towards opposing the carrying out of the provisions of the Local Government Act in Canterbury. It is well known that the city has a notoriously bad and inefficient supply of water, and that the existing water company would rather hand over the work of meeting the requirements than carry it out themselves. Without questioning the reasonableness or otherwise of the price asked for the water-works, the absence of any attempt on the part of the party we have alluded to to come to terms, clearly demonstrates that their desire is to adopt the obstructive course.

The question of drainage, too, has been shelved from time to time, and the Anti-Local Government Act party have passed a resolution in committee, asking the Town Council to appoint a deputation out of members of the corporation to visit those towns where Mr. Pilbrow's system of drainage has been carried out, with a view to ascertain for themselves its efficiency or otherwise.

There is reason, however, to believe that matters will soon be arranged, as it is not improbable the work of carrying out properly and efficiently the Local Government Act in Canterbury will form one of the duties of Her Majesty's Secretary of State.

METROPOLIS GAS SUPPLY.

CITY COURT OF SEWERS, GUILDHALL—TUESDAY, MARCH 12.

At the Ordinary Weekly Meeting of the Commissioners, this day—Deputy WHITE in the chair,

The SURVEYOR made a report upon a complaint of the Chartered Gas Company, which had been referred to him, that the governors had been removed from some of the public lamps in their district by an officer of the commission. The reported stated that the officer in question had from time to time, and in different part of the City, taken down the regulators of their company to ascertain whether under various pressures the quantity of gas undertaken to be supplied was really given. These regulators had, however, always been replaced the same day, and the lamps never left without them for a single night. Previously to the passing of the Metropolis Gas Act, 1860, the commissioners reserved the power in their contracts with the company to adopt any means they might think necessary to test the pressure or size of the burners, to enable them to see that the stipulated quantity of gas was supplied, and such power was never objected to by the gas companies. It appeared to the surveyor that the commissioners still had that power, as the regulators were fixed to their lamps. Indeed, without such permission, the commissioners might as well give the contract of supply up to the companies altogether. He recommended that the Chartered Company should be written to, and asked the reason why they objected, and the precise course they wished the commissioners to adopt with reference to the cause of complaint.

The report was agreed to.

A COURSE OF LECTURES ON COAL GAS.

BY DR. FRANKLAND, F.R.S., &c., &c.

[*Delivered at the Royal Institution of Great Britain.*]

FIRST LECTURE.—THURSDAY, MARCH 7.

The manufacture of coal gas depends upon the instability of organic matters at high temperatures. When exposed to a heat of full redness, nearly all organic bodies break up into new compounds. The decomposition of coal under these circumstances is the particular instance of the kind with which the manufacture of coal gas furnishes us. In the decomposition of coal for the production of gas, we expose in certain convenient vessels fragments, large or small, of coal to a temperature approaching bright redness. At this temperature the coal undergoes decomposition, and products are evolved, some gaseous, some liquid, and some solid. The larger proportion are volatile, but one of them—viz., carbon, remains behind in the vessel in which the heating operation is performed, as a porous, solid mass, known as coke. In the diagrams before you, the various apparatus employed in the manufacture of coal gas are illustrated, and it will be necessary to say a word or two about them, although our object in these lectures is rather to search into the philosophy of the matter, and to ascertain what chemical and physical principles are involved in the production and use of this material, which we employ so extensively as a source of artificial light. [The lecturer explained the several diagrams, and pointed out the *modus operandi* of gas manufacture.] Having thus briefly glanced at the apparatus used in this manufacture, it will now be necessary for us to investigate the source of light in a gas-flame, for without knowing something of this it is impossible to appreciate the value of the different kinds of retorts employed, or the use of the purifying apparatus, or the necessity for certain processes of purification being performed upon the gas. I have before me a gas-flame burning in the usual way, and you ask me what is the source of light in this gas-flame. To what is the luminosity arising out of the combustion of coal gas in atmospheric air attributable? The usual explanation is something like the following:—The gas contains certain compounds of carbon and hydrogen, called hydrocarbons, and these compounds are decomposed in the interior of the flame, with the deposition of little solid particles of sooty matter. These fine but solid particles of carbon are suspended for a short time in the flame, are there rendered incandescent or intensely white hot, and in that state constitute the source of the light which is emitted from the flame. These little particles of carbon are supposed to set the ethereal medium in undulation, and to communicate to it impulses of such a nature as to produce all kinds of light. In fact, if you decompose the light of this flame you have a continuous spectrum from the extreme red to the extreme violet. Various experiments have been adduced in proof of this theory. One of these consists in depressing upon a gas-flame a piece of wire gauze, which arrests the combustion by its cooling action. The little particles, which are supposed to be carbon, pass through the gauze, and issue as a dense smoke from the upper side of it. The same result is obtained by exposing to a flame of this kind a piece of white porcelain, upon the surface of which we get a quantity of sooty matter deposited. As a further proof of these particles of carbon being the source of light in a gas-flame, we generally have the fact adduced that if gas previous to combustion be mixed with atmospheric air in sufficient quantity we get none of these effects. I have before me a burner supplied with gas in which is a large admixture of atmospheric air, and you see it produces no light, and if we test the flame with wire gauze or porcelain there is no trace of black particles produced. Again, if I take this lightless flame, and sift into it some particles of carbon through a wire gauze, you will observe that we obtain a certain luminosity. It is further also found that those gases which are contained in coal gas, and which do not deposit soot in burning, give practically no light. Here, for instance, is one—hydrogen—which gives practically no more light than coal gas mixed with atmospheric air. If, however, I sift into it some particles of carbon, it can be made to give a certain amount of light. The same is the case with another constituent of coal gas—carbonic oxide—which on being ignited from a jet gives practically no light. Now, if I take this hydrogen flame, and increase its temperature considerably, as can be done by passing oxygen into the interior of it, I get but little more light than the hydrogen alone produced. But if I sift into the flame some particles of carbon, a very brilliant light is produced, owing to the particles of carbon being more intensely ignited than was the case in the previous experiment. These experiments appear to be conclusive that the light of a coal-gas flame depends, as alleged, upon minute floating particles of carbon. Besides this, the continuous spectrum which the gas-flame affords is brought forward as an additional proof that it must be incandescent solid matter from which the light is derived. Nevertheless, although these proofs appear very strong, and are usually considered conclusive, I have, during some recent experiments on this subject in connexion with this course of lectures, been led to doubt the truth this of theory, and I propose to lay before you the grounds upon which those doubts rest. With this view let us look a little more closely into the matter. We will begin by considering again the flame of hydrogen. Now this flame, burning as it is now doing in free air, possesses a temperature, according to calculation, of 3776° Fahr. If I feed it with oxygen instead of atmospheric air, which last contains inert nitrogen to the extent of four times the volume of oxygen present in it, and which nitrogen cools the flame, and renders the products of combustion of much lower temperature, I get a heat of 7364° Fahr. Still even with this very high temperature you will observe that the luminosity of the flame is scarcely increased. The heat of the flame is sufficiently intense to fuse platinum and dissipate iron wire; still there is no luminosity, and even if we burn considerable quantities of these gases together, as we can do by introducing a mixture of them into a solution of soap and water, and then igniting them, we get no light. On applying a flame we get a violent explosion, but scarcely any evolution of light during the combustion of the larger quantity of gas in the soap bubbles. In the experiment just now made we had the almost instantaneous combination of oxygen with hydrogen, a combination which takes place much more slowly in the flame we were burning previously. This instantaneous combination is attended with the production of the same temperature of 7364° Fahr. which we had in the quiet flame previously obtained, and at the moment of the explosion the gaseous mixture expands to about ten times its former volume, which is, in fact, the reason of the noise, for the instantaneous expansion causes a great wave of air, which rushes through the theatre and gives you the impression of the noise of the explosion. This expansion is occasioned by the heat produced on the combination of the two gases, oxygen and hydrogen. Now when a cubic inch of these gases thus combine, only two-thirds of a cubic inch of steam is produced. If we conceive this combination to take place at the bottom of a tube 10 inches high and 1 inch square, the explosion of these gases is quite sufficient to fill the tube, and in thus expanding they would have to lift the superincumbent atmospheric air to the top of the tube—*i.e.*, they would have to lift 15 lbs. of atmospheric air to a height of 9 inches. To perform this amount of work it is necessary that a certain quantity of the heat produced in the combustion should be expended, and we know from the researches of Joule and Mayer that the exact amount required for this mechanical effort is that necessary to raise two-thirds of a cubic inch of water through ·592° Fahr. But the heat is applied in the explosion not to two-thirds of a cubic inch of water, but of steam, and two-thirds of a cubic inch of steam would be raised by the application of this amount of heat through 2121° Fahr.; so that if we could explode the gases under circumstances in which they would not be allowed to expand, we should be able to increase the temperature 2121° Fahr. in addition to the 7364° Fahr., which is the temperature produced when the gas is exploded in free air, making together a temperature of 9485° Fahr. Let us see what effect these altered conditions have upon the light evolved during the combination of the two gases. I have here a vessel which contains the two gases that were mixed in the soap bubbles, but when I pass a spark through

them, you will find that we have a very different effect. There was no noise when the spark passed, because the gases were not allowed to expand or increase at all in their bulk. The consequence was that we got an intense luminosity by the consumption of the two gases under the new conditions. Of course, it will be said that this light was produced by the increased temperature at the moment of explosion. It is the most obvious explanation that this increase of 2121° temperature would be sufficient to account for the great increase of light resulting from the explosion in a confined space. We found, however, in our previous experiment that an increase of 3588°, which is the difference between the temperature of hydrogen burning in air and in oxygen did not contribute very appreciably to the amount of light produced. But the moment we confine the gases, to prevent their expansion, we get a dazzling light. And this is by no means a solitary case in point. I have recently been experimenting with several gases, and I do not believe that there is a single explosive mixture of gas which, if allowed to combine under similar circumstances, will not produce brilliant light. Take the same gas that we have been employing—hydrogen—and burn it in chlorine instead of oxygen. We then get a little more light than if we burned it in atmospheric air, but still the flame possesses a very feeble luminosity. Let us try a mixture of carbonic oxide with oxygen. The temperature produced when carbonic oxide burns in the atmosphere is 5122°, and in oxygen 12,794°, being an increase of 7672°; and yet we get but very little more light by transferring the flame from air to oxygen. Having thus convinced ourselves of the slight luminosity of this gas, when burned either in atmospheric air or oxygen, if the product of combustion be allowed to expand freely, we will now try the experiment in a closed chamber. [Experiment performed, as also a similar one, in which a mixture of hydrogen and chlorine was exploded in a close vessel.] You see that in all these instances in which the gas is burned without being allowed to expand we get a very powerful luminous effect, though not in a single instance have we a trace of solid matter produced. I say, therefore, that it is possible, at all events, for gases to emit light of very considerable intensity, without the existence of any solid particles of matter, if they are only put under proper conditions. Many other instances might be given of the production of light and flame without solid particles from gaseous mixtures in which no such particles exist. The following additional cases will, perhaps, serve to clear the way to our comprehension of the true source of light in a gas-flame. There is a remarkable instance, and the one which first led me to doubt the correctness of the usual theory. It is the combustion of metallic arsenic in a stream of oxygen. Now arsenic is very volatile, and the product of it—viz., arsenious acid—is also very volatile. Here is a glass tube, the bulb of which contains a fragment of metallic arsenic, which I will ignite in a stream of oxygen gas. You will observe that, though there are here no solid particles, we yet obtain a fair amount of light. I may illustrate the same thing in atmospheric air. I take a hydrogen flame and plunge into it a little fragment of metallic arsenic, which will volatilize in the flame, and impart a considerable degree of luminosity to it. We will now try the experiment with a piece of arsenious acid—the product of the combustion of arsenic—which will be seen to produce the same effect. In fact, arsenic gives such an amount of light when fed with oxygen, during combustion, that it has been used for the purpose of a signal-light. It is called "Indian fire," and has been employed in trigonometrical surveys for signalling from station to station. It contains no material which is not volatile at the temperature at which this substance burns; but we nevertheless get a very intense light by its combustion, which may be regarded essentially as the burning of arsenic and sulphur in oxygen, and there is probably in this flame no substance present in a solid condition. We have seen, then, that the theory which attributes the light of a gas-flame to the presence of solid particles, meets with considerable contradiction. There are many considerations which combine to shake our faith in this theory as far as we have gone. In the next lecture we will resume this subject, and endeavour to decide what is the true source of light in a gas-flame.

SECOND LECTURE.—SATURDAY, MARCH 9.

In the last lecture we glanced very briefly at the apparatus and processes used in the manufacture of coal gas. We then proceeded to study the philosophy of the flame of coal gas, more especially the luminosity of that flame. I explained the theory which has hitherto obtained, that this light is dependent upon the incandescence of solid particles of carbon present in the flame, and laid before you the proofs upon which this theory is usually supported. We then proceeded to inquire into the correctness of the theory, and we found considerable reason to doubt the truth of the general proposition that the light of a gas-flame is due to the presence of solid particles at all. We began by investigating a hydrogen flame, which gives practically no light, even when its temperature is enormously increased by feeding it with oxygen. The same thing we found to be the case with carbonic oxide, and so also with hydrogen gas, if burnt in chlorine. When, however, we looked more closely into the matter, we found that there were conditions in which the so-called non-luminous gases might be consumed so as to give a very brilliant light. We saw that, in the case of hydrogen and oxygen, if we prevented the expansion of the products of combustion at the moment of explosion by the electric spark, instead of hearing a tremendous noise, as is the case in free air, there was no noise at all—no wave of air—but in place of this we had a brilliant light in the vessel which contained the gas. It was the same with a mixture of carbonic oxide and oxygen when exploded under similar circumstances, and also with hydrogen and chlorine when exploded in the same vessel. It was evident, from these experiments, that the presence of solid matter in the flame is not essential to its luminosity, for it is well known that these gases are incapable of depositing solid or liquid particles in the flame. The luminosity was due, therefore, purely to ignited gaseous matters. Now, let us push this subject a stage further before we leave it. It was mentioned, on the last occasion, that I had made some experiments which have a close bearing upon this question. In the first place, here is a liquid called by chemists bisulphide or bisulphuret of carbon. When inflamed in contact with air it produces a lambent blue flame, with practically no light at all. It is more luminous than a hydrogen flame—perhaps about as luminous as that of carbonic oxide. Burning in atmospheric air, there is no deposit of carbon, as will be seen by holding in the flame a piece of porcelain. There is a small deposit of sulphur, but that, we know, is very volatile: so that there is no question of solid sulphur particles existing in the interior of this flame. Now, if solid particles do not exist in the flame when burning in air, you will admit that it is impossible they should be there when we burn it in oxygen, because, in the latter case, all the carbon has more chance of being oxidized. But we now get one of the most brilliant lights which is to be obtained by chemical means, and one that is employed a good deal by photographers for the production of instantaneous pictures. I wish now to vary this experiment a little. We will take a gas which is known under the name of nitric oxide, and which is capable of burning in the vapour of bisulphide of carbon. I have here a wide test-tube in which is placed a small quantity of bisulphide of carbon. If the bisulphide of carbon be now heated, and a jet of nitric oxide introduced into its vapour, the nitric oxide may be ignited, and we thus get a dazzlingly luminous flame. [Experiment performed.] Now there is positively nothing solid in that flame; it consists purely of gases and vapours, and no solid matters can exist in it. We will try another form of this experiment. Here is a jar of nitric oxide, the same gas that we were burning in the bisulphide of carbon. Into it I throw a glass bulb containing bisulphide of carbon, so as to get the nitric oxide well charged with the vapour of it. On ignition, we have now a light produced which is nearly insupportable to the eye, and yet this mixture deposits no solid particles at all; the light is due solely to the ignition of gaseous matters. Hence we may consider that the hypothesis which considers the presence of solid particles in a flame as necessary for the production of light is disposed of. The argument resting on the continuous spectrum of a gas-flame is equally fallacious, for the light of this flame of nitric oxide and bisulphide of carbon and the light of the flame of arsenic burning in oxygen, exhibited in the last lecture, give a perfectly continuous spectrum like the light from a coal-gas flame. Let us now inquire whether luminosity of flame depends on temperature. There can be no doubt that temperature has considerable influence upon the intensity of light, as you will see from the two following experiments. You all know the kind of light with which sulphur burns in free atmospheric air. If it burns in oxygen, as it is now doing, the light is much more intense—probably 20, or even 30 times what it was before. But all that has been done is to raise the temperature of combustion. There are no solid particles in the flame; the greater intensity is solely owing to the temperature being raised by feeding the sulphur with oxygen in the place of atmospheric air. This elevation of temperature depends upon the circumstance that in oxygen there is nothing present but what is necessary to combine with the sulphur, whereas, in atmospheric air, the oxygen is mixed with four times its volume of nitrogen, which reduces proportionately the temperature of the flame. You see, therefore, that temperature has something to do with the amount of light produced. Let me give you another illustration—viz., phosphorus. When burned in atmospheric air, phosphorus gives a considerable light, but it gives a very greatly increased light when burned in oxygen. Why do I use phosphorus? Because it is commonly believed that in this experiment the light arises from solid particles of anhydrous phosphoric acid. But this acid is decidedly volatile; it cannot resist a white heat; it volatilizes before the temperature reaches whiteness, and inasmuch as the temperature of phosphorus burning in oxygen is much higher than white heat, I do not believe there is a trace of solid matter in the flame when it is so consumed, and I regard this as an example of the production of light from gaseous and vaporous matters alone. However, as this is a point which might possibly be disputed, I will not insist much upon the value of the experiment in this respect. We see, then, that temperature certainly has an influence when you once begin to get your luminous effect from any substance. We have seen, however, that a rise in the temperature of 3588° did not produce any marked increase of light when hydrogen was burnt with oxygen; the same was the case when we increased the temperature of carbonic oxide 7672°. What other additional condition, then, came into play when our flame of oxygen and hydrogen, and hydrogen and carbonic oxide, and hydrogen and chlorine became intensely luminous? You remember the conditions under which we made those experiments. You recollect that we confined those gases in a close vessel, so that they could not expand in burning, and the consequence was that the vapour or gas was, in the case of oxygen and hydrogen, ten times as dense as it was when these gases were burned in free atmospheric air. If we examine the substances we have been experimenting upon, we shall find that our success in getting light from them, at the ordinary atmospheric pressure, has varied almost exactly with the increase of the density of their vapours. The table before you represents the relative densities of gases and vapours, hydrogen being taken as unity.

Hydrogen	1
Steam	9
Hydrochloric acid	18¼
Carbonic acid	22
Sulphurous acid	32
Terchloride of arsenic	90¼
Anhydrous phosphoric acid	71 or 142 (?)
Metallic arsenic	150
Arsenious acid	198

In experimenting upon arsenic, you remember the brilliancy of the flame produced when we burned it in oxygen. What is the density of arsenic vapour? This vapour possesses what chemists call an abnormal density; it is squeezed into half the space it ought to occupy, and the consequence is that its vapour is exceedingly dense. The density of metallic arsenic vapour is 150, hydrogen being taken as 1. It produces on combustion arsenious acid, which is the common arsenic of the shops. This again has an abnormally high density; it has a density no less than 198 times that of hydrogen; and hence when burning arsenic in oxygen, we have to do, in the first place, with a substance which gives a dense vapour, and we produce another substance which possesses a still greater vapour density. Then, again, in the combustion of phosphorus we get anhydrous phosphoric acid. The density of this has not been ascertained; but inasmuch as the density of phosphorus is abnormal, like that of arsenic, it is not improbable that the vapour of its oxide will also have twice its normal density. In that case it will have a density of 142. Although there are some deviations from this law, yet, taking the whole range of substances with which we have experimented, we see clearly that the density of the vapour is in some way connected with the evolution of light—that the more dense the vapour the greater the amount of light we obtain. If this be so, then any flame which is producing light by virtue of the dense vapour in it ought, if the flame be made to burn under reduced pressure, to have its luminosity diminished. If we cause arsenic to burn under greatly reduced pressure, so as to expand its vapour and make it much lighter, the amount of luminosity ought markedly to decrease; and this is the case, as you will perceive by the rapid diminution of the light from this arsenic, as I rarefy the oxygen in which it burns. [Experiment performed.] You thus see that, by increasing the volume of the arsenic vapour, the light was correspondingly diminished. We shall learn presently the bearing of this experiment upon gas-flames themselves.

You will now, I have no doubt, perceive the principles which I have endeavoured to bring out by these experiments, and now let us ascertain their particular bearing upon the light of a gas-flame. In the first place, everybody admits that a gas-flame owes its luminosity to certain compounds which chemists call hydrocarbons. Every one knows that if these

hydrocarbons are not put in the gas by the manufacturer you do not get the light you ought; and when your gaslights are particularly dim, you may be tolerably certain that you have too small a quantity of these hydrocarbons in the article supplied to you. These, then, are the raw materials which furnish the light of a coal-gas flame. Now, how do these hydrocarbons behave when exposed to heat? Their behaviour has been carefully studied by many chemists, and the result is found to be that on the application of heat they gradually lose hydrogen, which separates from them while the carbon shrinks, as it were, closer together—that is to say, the carbon out of 5 or 6 or 20 volumes of these vapour all gets shrunk up into one volume. In the table before you showing the products of the destructive distillation of coal, we have, in the first place, marsh gas, or hydride of methyl, which contains 1 atom of carbon and 4 of hydrogen; when submitted to the action of a strong heat, it is transformed into acetylene, which is also a body present in coal gas. In this acetylene ($C_2 H_2$) the carbon, from two volumes of marsh gas, has shrunk into one volume of acetylene, and there is here twice as much carbon as there is in the same volume of marsh gas. The process does not stop here. By the prolonged application of heat benzole ($C_6 H_6$) is obtained, and naphthaline ($C_{10} H_8$), which is well known to gas manufacturers to be produced in the process of gas-making; and it is known, too, that this latter substance is formed when olefiant gas is subjected to heat. You see it contains ten times as much carbon in the same volume as marsh gas, and now you will understand how the density of the vapours of these substances must increase when all this carbon is squeezed into one volume. But there are other substances—chrysene, which has 12, and pyrene, which has 15 times as much carbon in the same volume as marsh gas. Now, in the manufacture of coal gas, and in its passage through red-hot tubes, there are produced many other substances, and amongst these a very heterogeneous material called pitch. What is pitch? It consists essentially of a conglomeration of such substances as chrysene and pyrene, and of others possessing probably a much higher density. Nevertheless these substances are essentially volatile, for this pitch actually distils over from the retorts, and is condensed in the hydraulic main and in the condensers, and is subsequently obtained by rectifying the tar deposited in these vessels. It is to such substances as are contained in this pitch, and to such bodies as benzole, pyrene, and chrysene—bodies of high atomic weight—that I believe the luminosity of coal gas to be due. The gaseous hydrocarbons are acted upon by the intense heat of the flame and are decomposed into the vapours of these substances. These bodies, formed at the expense of the original gaseous hydrocarbons, continue to exist in the flame of coal gas until they reach the external surface, where they are consumed by the atmospheric air with which they then come in contact. Such substances act like arsenic or phosphorous vapour, and constitute the source of light in a gas-flame.

But it will be said, how is it that if we put a piece of white porcelain into a gas-flame, we get this sooty matter deposited which is generally regarded as carbon? There is no proof that it is carbon. If you examine it chemically you will find that it always contains hydrogen, and the chemist knows very well that if he wants to get carbon perfectly free from hydrogen from this substance, it is necessary to ignite the black deposit for a long period in order to get rid of the hydrogen. And this, indeed, is not sufficient; for chemists are in the habit of passing chlorine over it while in a white-hot tube, in order to get rid of the last traces of hydrogen from it. So that the substance commonly considered as carbon has really no claim to be so considered. It is a conglomeration probably of a number of these heavy condensed substances which are giving light in the interior of the flame, and become condensed on a cool surface held in the flame. The same is the case when you cut the flame in two with a piece of wire gauze and get the smoky matter. If you could examine the gas as it comes from the retorts, and before it is purified, you would see that it is full of this sort of smoke. This black substance is, indeed, the fog of these heavy hydrocarbons formed in the interior of the flame.

There is another circumstance connected with the flame of gas which also tends to confirm this view of the source of its luminosity, and that is the perfect transparency of the flame. Take the flame of a fishtail burner, and notice with what facility you can read the smallest print through the thickest part of it. Further, if such a flame be examined photometrically, the intensity of the light which is given off from the flat side of the flame, and from the thin edge, will be found to be exactly the same. This could hardly be so if the light had its source in ignited solid particles, for such particles would get behind one another and stop each other's light, and you would, therefore, get less light from the edge than from the flat side of the flame. I do not mean to assert that the decomposition of the hydrocarbons is never complete in the gas-flame, and that under no circumstances does a single particle of elementary carbon ever separate in such a flame; but I do maintain that the luminosity in a gas-flame is almost entirely due, not to this source, but to the ignition of the very dense vapours which are produced at the expense of the gaseous hydrocarbons contained in the coal gas.

We must now, however, pass to another part of our subject, which is very important in the practical aspect of the question of gas lighting—viz., the mode of estimating the illuminating power of gas. The methods in use for this purpose, which are generally classed under the name of photometry, depend essentially upon the law that the amount of light which falls upon any given surface, placed perpendicularly to the direction of the light, is universally as the square of the distance of that surface from the light—*i. e.*, if one of two surfaces of equal area be placed at twice as great a distance from the light as the other, it will only receive one-fourth of the light of the one which is at half the distance. There are various modes of applying this law to the estimation of the light of gas-flames. Of course we must have a standard of comparison. The standard in this country is the spermaceti candle of six to the pound, which candle is capable of burning 120 grains of sperm per hour; but as it is impossible to get a candle to burn exactly that quantity, all careful experiments are made by weighing the candle before and after the experiment, to ascertain accurately the rate of consumption. If you could contrive to illuminate two portions of a white surface closely approximating together, one of those portions from the sperm candle and the other from the gaslight with which you wish to compare it, you would, by bringing the weaker light nearer to the surface, so as to get an equal amount of illumination upon it with that produced by the stronger light, be able to measure the illuminating value of each. This mode of proceeding is generally known as the shadow test, and it is a test of more interest to us, perhaps, than any other, because every one can make it with the greatest ease, and with considerable exactness. [Experiment performed.] Nevertheless, for the more accurate measurement of the illuminating power of coal gas, a different mode is employed, a description of which we must, however, defer until the next lecture.

DR. HILLIER'S REPORT ON THE GAS SUPPLIED BY THE IMPERIAL COMPANY TO THE VESTRY OF ST. PANCRAS DURING THE MONTH OF FEBRUARY, 1867:—

Maximum light estimated by sperm candles according to the Act	15·6
Minimum light—sperm candles	14·3
Average light—sperm candles	14·9
Traces of ammonia, indicated by turmeric test-paper	Usually
Traces of sulphuretted hydrogen, indicated by lead test-paper	Never

The illuminating power of the gas has been higher than usual, averaging above 14·5 candles. It once reached 15·6 candles. There has been rather less ammonia than before, but still an excess. There was no sulphuretted hydrogen. Of sulphur in 100 cubic feet of gas there was less then 10 grains.

DR. WHITMORE'S REPORT ON THE QUALITY OF THE GAS SUPPLIED IN ST. MARYLEBONE, IN FEBRUARY, 1867:—

February.	Illuminating Power in Sperm Candles.			Mean Pressure in 10ths of an inch.	
	*Mean of 24 Observations.	Highest.	Lowest.	Highest.	Lowest.
Imperial Company's gas	14·60	15·90	14·10	19·35	6·96
Chartered Co.'s common gas	12·52	13·96	12·05	32·38	13·77
Chartered Co.'s cannel gas	23·32	25·58	20·65	29·56	7·53

* Each observation consists of 10 readings of the photometer.

On no occasion during the month of February has the illuminating power of either of the three gases consumed in the parish been found to be below the parliamentary standard, but on the contrary—as will be seen by reference to the above table—the mean intensity of light given by the gas of the Imperial Company and the cannel gas of the Chartered Company was considerably in excess of it; in the former the excess was equivalent to two and a half candles, or 21 per cent.; and in the latter to something over three and a quarter candles, or 16½ per cent. With regard to pressure, the cannel gas has at times been very unsteady, but until I have had the opportunity of examining the meter and other apparatus at the court-house through which this gas passes, it will be impossible to say where the responsibility for this defect lies. In all the gases the quantity of sulphur found has been considerably less than what the law allows. No trace of sulphuretted hydrogen has been detected by the ordinary test, but traces of ammonia always.

DR. WHITMORE'S REPORT ON THE QUALITY OF THE WATER SUPPLIED IN ST. MARYLEBONE, IN FEBRUARY, 1867:—

February.	Total Solid Matter in degrees or grains per Imperial gallon.		* Loss by Incineration of Solid Matter in previous column.		Ammonia.
	Feb., 1866.	Feb., 1867.	Feb., 1866.	Feb., 1867.	
Distilled Water	0°	0°	0°	0°	0°
West Middlesex water	19·24	20·44	1·64	·72	—
Grand Junction water	19·48	20·48	1·28	·84	—

* The loss by incineration represents the amount of organic and other volatile matters contained in an Imperial gallon (70,000) grains of water.

DR. FRANKLAND'S REPORT TO THE REGISTRAR-GENERAL ON WATER SUPPLY.

Royal College of Chemistry, March 8, 1867.

Sir,—I have the honour to submit to you in the following table the results of the chemical examination of the waters supplied to the metropolis during the month of February last.

Analysis of the Metropolitan Waters in February, 1867. *By Professor Frankland, F.R.S., of the Royal College of Chemistry.*

Companies.	Date and Place of Collection.	Total Solid Impurity.	Organic Carbon.	Nitrogen, as Nitrates and Nitrites.	Ammonia.	Total combined Nitrogen.	Previous Sewage Contamination (Estimated).	Total Hardness.
Thames.								
Chelsea	Feb. 1—Cab Rank, Horse Guards	28·58	·433	·337	·004	·371	2420	16·2
West Middlesex	Feb. 1—Gt. Portland Street	28·68	·340	·356	·006	·412	2630	16·2
Southwark & Vauxhall	Feb. 1—Barclay's Brewery	29·08	·293	·357	·005	·361	2630	16·8
Grand Junction	Feb. 1—Royal College of Chemistry	29·44	·417	·322	·004	·325	2270	17·1
Lambeth	Feb. 1—Cab Rank, Westminster Rd.	29·36	·423	·341	·005	·356	2470	16·0
Other Sources								
New River	Feb. 15—Cab Rank, Tottenham Ct. Rd.	29·72	·272	·350	·003	·396	2540	18·5
East London	Feb. 16—Cab Rank, Shoreditch	33·56	·293	·357	·004	·392	2820	18·8
Kent	Feb. 15—Water-Works, Deptford	39·84	·088	·421	·008	·428	3300	23·1
South Essex*	Feb. 16—Mr. Whiffin's, Romford	38·32	·143	·844	·007	·850	7520	21·1
Column 1	2	3	4	5	6	7	8	9

* This company does not supply London.

The numbers in columns 3, 4, 5, 6, 7, 8, and 9 all relate to 100,000 parts of the waters. Column No. 3 shows the total solid impurity contained in each water as delivered from the companies mains. No. 4 shows the amount of carbon contained in the organic matter present in this solid impurity. No. 5 the amount of nitrogen in the form of salts of nitric and nitrous acids. Column No. 6 gives the amount of ammonia present in each sample, whilst column No. 7 records the total amount of nitrogen in the several forms of nitrogenous organic matter, salts of nitric and nitrous acids and ammonia. The most objectionable impurities contained in water supplied for domestic purposes are organic matters of animal origin, such as those contained in sewage and in the manure of cultivated land. After admixture with river

or spring water these organic matters undergo slow oxidation, by which they are more or less completely resolved into comparatively innocuous inorganic compounds; their carbon is converted into carbonic acid and their hydrogen into water, and these products can no longer be identified in the aërated waters of the river or spring; but the nitrogen, which is an essential constituent of these noxious organic matters, is converted into nitrous and nitric acids, which, combining with the bases contained in most waters, remain dissolved, and constitute a record of the sewage or other analogous contamination to which the water has been subject. With certain corrections the analytical determination of the nitrogen contained in these salts and in the form of ammonia writes, as it were, the history of the water as regards its contact with decomposing animal matter. Such *previous organic contamination* may be conveniently expressed in parts of average filtered London sewage, which, if contained in 100,000 parts of the water, would produce the same results when thus completely oxidized. This previous sewage contamination or its equivalent is given in column 8, average filtered London sewage being taken as containing 10 parts of combined nitrogen in 100,000 parts, as deduced from the numerous analyses of Way, Hofmann, and Witt. Finally, column 9 expresses the amount of carbonate of lime, or its equivalent of other hardening salts, contained in 100,000 parts of the waters.

The table will now be intelligible; it may be thus read: 100,000 lbs. of East London water collected on the 16th of February at a cab-rank in Shoreditch contained 33·56 lbs. of solid impurity; the organic matter, constituting a portion of this impurity, contained 0·293 lb. of carbon. This solid impurity also contained 0·357 lb. of nitrogen in the shape of nitrates and nitrites, besides 0·004 lb. of ammonia, whilst the total amount of *combined* nitrogen in every form was found to be 0·392 lb. Such combined nitrogen is to be carefully distinguished from the *uncombined* nitrogen of the air which is present in all natural waters. The above quantity of water supplied by the East London Company had been, after its descent to the earth as rain, contaminated with sewage or manure matter equivalent to 2620 lbs. of average filtered London sewage. By gradual oxidation, partly in the pores of the soil, partly in the river Lea, and partly in the reservoirs, filters, and conduits of the East London Company, this sewage contamination had been entirely converted into comparatively innocuous inorganic compounds before its delivery to consumers. Finally, 100,000 parts of the East London water contained 18·8 lbs. of carbonate of lime, or their equivalent of other soap-destroying ingredients.—I have, &c.,

The Registrar-General, &c. E. FRANKLAND.

The Registrar-General has to acknowledge the courtesy of the London water companies, who have furnished him with the average daily quantity of water supplied for the months of January and February, 1867: thus, according to their account, 427,559 cubic mètres of water, equal to about as many *tuns* by measure, *tons* by weight, were supplied daily in January, and 432,246 cubic mètres in February.

Companies.	Number of Houses Supplied in January, 1867.	Average Daily Supply of Water in Gals. during the Month of January, 1867.	Number of Houses Supplied in February, 1867.	Average Daily Supply of Water in Gals. during the Month of February, 1867.
Thames.				
Chelsea	26,783	7,060,300	26,783	7,912,200
West Middlesex	36,331	8,195,541	36,331	8,666,760
Southwark and Vauxhall	73,960	13,100,000	73,960*	13,100,000
Grand Junction	26,450	5,726,624	26,450	6,845,640
Lambeth	37,263	8,678,000	37,586	8,090,000
Other Sources.				
Kent	33,864	6,080,750	33,864	6,250,462
New River	112,964	22,339,000	112,990	22,296,000
East London	91,975	19,924,000	91,975	19,975,000
South Essex†	920	193,970	940	200,420

Note.—The water includes the supply for manufactures and for various purposes other than domestic consumption. Total number of houses supplied in January, 439,530; and in February, 439,739. Average daily supply of water in January, 94,104,217 gallons; and in February, 95,136,062 gallons.

* No return for the month of February has been received from the Southwark and Vauxhall Water Company; the figures for January are therefore repeated in this table for February.

† The secretary to the South Essex Water-Works Company, writing in October, 1866, said—"We have not extended our mains at present west of Romford;" in other words, not to London.

COMPOSITION AND QUALITY OF THE METROPOLITAN WATERS, IN FEBRUARY, 1867.—The following are the returns of the Metropolitan Association of Medical Officers of Health:—

Names of Water Companies.	Tot. solid Matter per gal.	Loss by Ignition*	Oxidizable Organic Matter.†	Hardness.	
				Before Boiling.	After Boiling.
Thames Water Companies.	Grains.	Grains.	Grains.	Degrees.	Degrees.
Grand Junction	20·29	1·96	1·35	13·0	5·5
West Middlesex	20·00	2·00	1·81	13·0	5·0
Southwark and Vauxhall	20·00	2·14	1·02	13·0	5·0
Chelsea	20·17	1·75	1·18	13·0	5·0
Lambeth	20·47	1·99	1·61	13·0	5·0
Other Companies.					
Kent	27·21	2·25	0·08	16·5	9·0
New River	21·12	1·76	0·48	13·5	3·5
East London	22·75	2·50	0·80	13·5	5·0
Surface Wells.					
Bishopsgate Church	86·66	6·23	0·88	34·0	15·0
Fenchurch Street	85·93	7·23	0·40	16·0	7·0

HY. LETHEBY, M.B.

* The loss by ignition represents a variety of volatile matters, as well as organic matter, as ammoniacal salts, moisture, and the volatile constituents of nitrates and nitrites.

† The oxidizable organic matter is determined by a standard solution of permanganate of potash—the available oxygen of which is to the organic matter as 1 is to 8; and the results are controlled by the examination of the colour of the water when seen through a glass tube two feet in length and two inches in diameter.

LONGTON GAS COMPANY.—The half-yearly meeting of the directors and shareholders of this company was held at the new offices of the works, Heathcote Road, on Thursday, the 28th ult. There was a tolerably good number of shareholders present; the chairman of the board of directors, Mr. W. Webberley, presided. Mr. John Ohren, the company's manager and secretary, read the half-yearly report and statement of accounts, which were presented to the meeting. The directors in their report express gratification at the satisfactory progress of the company's operations during the half year. The construction of the new works was being carried on with all despatch possible, but the late bad weather and severe frost had prevented the works being carried on as fast as the directors could have wished, and under the circumstances the directors thought it would not be prudent for the company to take the entire supply upon themselves until their works were thoroughly completed and adapted for the increased supply. They had, therefore, agreed with the Stoke Company to continue their supply until the 30th of June next. The balance-sheet for the half year to the 31st of December last showed that the profits for the half year were £714 13s. 8d., which, together with the balance of £11 13s. 5d. unappropriated from last account, amounted to £726 7s. 1d. Out of this sum the directors recommended the declaration of a dividend at the rate of 8 per cent. per annum, free of income-tax; the balance of £92 18s. 1d. to be carried to the next account.—The chairman, in moving that the report be adopted, congratulated the shareholders on the very satisfactory way in which the works were being carried out. It was further a matter for gratification that the extensive alterations and new erections had up to the present time been proceeded with without any accident occurring to the workmen. The premises when finished would be replete with every convenience and modern improvements; indeed, he might assure the meeting that when the works were finished they would be the largest and most complete works in North Staffordshire, and they had been erected from the designs of the company's engineer and manager (Mr. John Ohren), upon whom they reflected great credit. The report was received and adopted.—The directors having invited Mr. J. Webberley and Mr. Felix H. Hawley to examine the accounts of the company, the meeting elected the two gentlemen nominated as auditors for the succeeding year. A cordial vote of thanks was awarded to the directors for their management of the company's affairs for the past half year. The meeting closed with a vote of thanks to the chairman for presiding.

TUNBRIDGE WELLS.—Mr. Bazalgette, engineer of the Metropolitan Board of Works, has just made an important report to the local board of this town, in which he states that, after a personal examination of the northern (or Tunbridge) and southern (or Groombridge) valleys, he concurs in the views expressed by Mr. Lawson (the engineer whom the board had previously consulted), that the lands in the southern valley are best suited for irrigation with sewage. He suggests that, before designing works for such distribution of sewage, it would, of course, be prudent to treat for suitable lands for its reception. The lands which are available and can be irrigated by gravitation are known to the board, and whether they should purchase and lease such lands and farm themselves, or sub-let them, or lease the sewage to any of the present occupiers after conveying it to them, could be best determined by the board upon negotiations instituted by some land-surveyor on their behalf. In selecting the position of such lands, it may be roughly estimated that the cost of conveying the sewage to a distance in a covered channel would possibly be at a rate of about £5000 per mile. Mr. Bazalgette agrees with Mr. Lawson that about 200 acres will be required, and says that when available lands have been selected, the plans and estimates of the cost of conveying the sewage thither can be more definitely determined.

GAS-HEATED BOILERS.—An engine and boiler have been erected in the warehouse, No. 50, Cannon Street, City, worked by steam, generated by gas-heat, under the patent of Mr. Arthur Jackson. The fire offices, it is said, have admitted the system to be adopted without any increase of premium, and thus in all warehouses or other establishments where cranes, hoists, or other apparatus requiring power are in use, steam can be applied, without stoker, smoke, ashes, or dirt of any description. No brickwork or chimney is necessary. The space occupied is very small, and the furnace is fully kindled in a few seconds, and extinguished instantly.—*Builder.*

PRESENTATION TO MR. NORTH, OF BROMSGROVE.—On Tuesday, the 26th ult., the workmen employed at the Bromsgrove Gas-Works presented their late manager, Mr. North, with a nicely got-up cash-box, with a silver plate on the lid, on which the names of the donors were engraved. Mr. North is leaving Bromsgrove to fill the office of manager at Stourbridge Gas-Works. Mr. North has also been presented with a Bible by a working man.

MANUFACTURE OF ALKALINE SULPHO-CYANIDES AT THE PARIS GAS-WORKS.—At the suggestion of M. Regnault, the illustrious chemist and physicist, the Parisian Gas Company has decided to manufacture on a large scale alkaline sulpho-cyanides, and especially the sulpho-cyanide of sodium. The price fixed by the company is 3 fr. the kilogramme. Thanks to this decision, the introduction of sulpho-cyanides into photographic consumption is henceforth assured, for the company can produce 60 tons of them annually. —*Chemical News.*

HASTINGS AND ST. LEONARDS GAS COMPANY.—The rapid increase in the consumption of gas in these favourite sea-side residences, consequent on its low price and superior quality, has rendered it necessary to provide additional gasholder room, and the following tenders were received on the 9th inst., for a cast-iron tank, 111 feet in diameter and 24 feet deep, with the inner lift of a telescope gasholder, upon the plans and specifications of Mr. T. G. Barlow:—

	Tank, including excavations and piers for columns.	Gasholder.	Total.
Samuel Cutler	£5948 10 0	£3373 10 0	£9322 0 0
R. Laidlaw and Son	5354 15 0	2959 0 0	8313 15 0
Newton, Chambers, and Co.	5100 0 0	3125 0 0	8225 0 0
Cochrane, Grove, and Co.	5100 0 0	—	—
J and W. Horton	—	2935 0 0	—
H. Balfour and Co.	4970 0 0	2780 0 0	7750 0 0

The tender of Messrs. Balfour and Co. was accepted.

AN OLD SERVANT.—George Hill, the first man employed by the Bristol Gas Company, on March 9, 1817, completed his fiftieth year in the same employ on Saturday last. He lighted the first fire and charged the first retort in May, 1817. The post of honour was given to him to carry the banner at the head of the company's procession in June, 1838, in memory of the Queen's coronation, and again in 1848, at the Free Port procession. Hill, who is 74 years old, is employed at the company's station in St. Philip's.

Share List of Metropolitan Gas Companies.

No. of Shares issued.	Amount per Share.	Name of Company.	Amount paid up per Share.	Div. per Cent. per Annum.	Price per Share.
	£		£ s d	£ s d	£ s d
8000	10	Anglo-Romano . .	10 0 0	9 0 0	11 to 12
5000	20	Bahia (Limited) . .	20 0 0	4 0 0	16 10 0
1000	20	Do., preference .	20 0 0	10 0 0	27 10 0
750	20	Do., do., redeem.	10 0 0	10 0 0	12 10 0
30000	5	Bombay (Limited).	5 0 0	£5 intr.	4 to 4½
10000	5	Do., third issue .	4 0 0	£5 intr.	3 to 3½
10000	20	British, Limited . (Norwich, Hull-Sculcoates, Hanley, Tunstall & Shelton [Potteries), Trowbridge, & Holywell.)	20 0 0	10 0 0	27 to 29
12000	50	*Chartered*	50 0 0	8 10 0	51 to 52
6000	50	Do.	35 0 0	8 10 0	35 to 36
10000	20	*City of London*, A shares	20 0 0	8 0 0	23 to 25
10000	10	Do., B shares	10 0 0	4 0 0	6½ to 7
8000	10	Do., new shares.	10 0 0	8 0 0	11½ to 12½
25000	25	City of Moscow (L)	25 0 0	£7 intr.	16 to 17
17490	25	*Commercial* . . .	25 0 0	10 0 0	33 to 34
2500	20	Continental Union.	20 0 0	8 0 0	14 to 15
17500	20	Do.	15 0 0	8 0 0	9 to 10
10000	20	Do., preference .	20 0 0	7 0 0	
5827	5	County & Gen. (L)	5 0 0	nil.	
2000	5	Do., preference . (Pater, Pembroke, Ely, Lea Bridge, Northfleet, Walton, & Ware.)	5 0 0	nil.	
5000	10	*Crystal Pal. Dist.*	10 0 0	10 0 0	13 to 14
5000	10	Do., preference .	10 0 0	6 0 0	12½ to 13
10000	10	Do.	2 10 0	7 0 0	2½ to 3
4000	50	*Equitable*	50 0 0	10 0 0	65 to 66
4000	25	Do., new shares.	25 0 0	10 0 0	33 to 34
23406	10	European (Lim.) .	10 0 0	10 0 0	12½ to 13
12000	10	Do., new shares. Boulogne, Amiens, Rouen, Caen, Havre, & Nantes.)	5 0 0	10 0 0	6½ to 6¾
20000	10	*Gt. Cent. Gas Cons.*	10 0 0	10 0 0	12½ to 12⅝
5000	10	Hong Kong (Lim.)	10 0 0		8 to 10
26000	50	*Imperial*, old sh.	50 0 0	10 0 0	67½ to 68
1300	100	Do., bonds . . .	£100	10 0 0	175 to 180
7000	25	Imperial Austrian .	10 0 0		
28000	50	*Impl. Continental* (Amsterdam, Berlin, Ghent, Hanover, Lille, Rotterdam, Aix-la-Chapelle, Antwp., Bordeaux, Brussels, Cologne, Frankfort-on-M., Haarlem, Stolberg, Toulouse, & Vienna	43 15 0	16 0 0	95¼ to 96
400	100	Impl. Mexican (L.)	75 0 0		
3000	40	*Independent* . . .	40 0 0	10 0 0	53 to 56
3000	10	Do.	10 0 0	5 0 0	7 to 9
3000	20	Do.	12 10 0	7 10 0	13 to 14
7133	50	*London*	50 0 0	10 0 0	60 to 61
5610	25	Do., 1st pref. .	25 0 0	6 0 0	25 to 27
503	50	Do., 2nd pref. .	50 0 0	6 0 0	
214	50	Do., 3rd pref. .	50 0 0	6 0 0	
18781		Do., 1st pref. sk		6 0 0	
11828		Do., 2nd pref. sk		5 0 0	
12000	5	Malta & Medit. (L.)	5 0 0	3 0 0	3¼ to 4
6000	5	Do., preference .	4 0 0	7 0 0	4 0 0
30000	5	Oriental, Calcutta	5 0 0	8 10 0	5¼ to 5½
30000	5	Do., new shares.	1 0 0	8 10 0	1 to 1⅛
10000	5	Ottoman (Limited)	5 0 0		1¼ to 2⅛
10000	10	Pará (Limited) . .	10 0 0	6 0 0	9¼ to 9⅝
27000	20	*Phœnix*	20 0 0	10 0 0	24 to 24½
3600	100	Do., new	25 0 0	7 10 0	24 to 25
144000	Sk.	Do.	100 0 0	5 0 0	72 to 74
5000	20	*Ratcliff*	20 0 0	10 0 0	22 to 24
	20	Rio de Janeiro (L).	20 0 0	10 0 0	21 to 22
6959	5	Singapore (Lim.) .	5 0 0	3 10 0	
2000	5	Do., preference . Shanghai	5 0 0	7 10 0	
4800	50	*Sth. Metropolitan*	50 0 0	10 0 0	70 to 72
15000	10	*Surrey Consumers*	10 0 0	10 0 0	13½ to 13¾
10000	10	Do., new	5 0 0	10 0 0	7¾ to 8
9000	4	United General . . (Limerick)	4 0 0		
10000	10	*Victoria Docks.* .	5 0 0	6 0 0	
3000	10	*Wandsworth & Putney*	10 0 0	7 10 0	13½ to 14
20000	10	Western (L.) A sh.	10 0 0	10 0 0	13½ to 14
10000	10	Do., B shares.	5 0 0	10 0 0	6¾ to 7
10000	10	Do., C shares.	4 0 0	10 0 0	5½ to 5¾
20000	10	Do., D shares.	1 0 0	10 0 0	1¼ to 2
8000	5	*West Ham*	5 0 0	7 10 0	6 10 0
6000	5	Do., new shares.	3 0 0	7 10 0	3 18 0
551	10	West London Junction (Lim.). .	10 0 0	6 0 0	
520	10	Do., preference .	10 0 0	6 0 0	

Price Current.

CASTINGS.—*Per Ton.*

Average Weight of Cast-iron Gas-pipes, per Yard.

1¼ in.	2 in.	2½ in.	3 in	4 in.	5 in.	6 in.	7 in.	8 in.	9 in.	10 in.	12 in.
16	21	28	33	51	70	89	107	126	149	177	208 lb

Retail Prices are 5 to 10 per cent. higher.	London.	Glasgow.	Newcastle	Wales.	Yorkshire, Derbyshire, and Staffordshire.
	£. s. d.	£. s. d.	£. s. d.	£. s. d.	£. s. d.
Pig Iron, No. 1 (f.o.b.)	3 15 0	2 14 3	2 12 6	3 10 0	3 10 0
1¼ and 2-inch Socket-pipes	7 10 0	6 0 0	5 15 0	6 15 0	7 10 0
2½ and 3-inch ditto	7 0 0	6 0 0	6 5 0	6 10 0	7 0 0
4 and 5-inch ditto	6 10 0	5 10 0	5 15 0	6 0 0	6 10 0
6 inches and upwards ditto	6 5 0	5 0 0	5 10 0	5 15 0	6 5 0
Retorts, 1st fusion, hot blast	6 0 0	—	5 5 0	5 10 0	6 0 0
Ditto, 2nd ditto, cold ditto	7 0 0	5 15 0	5 15 0	6 0 0	7 0 0
Tank-plates, ¼ thick and above	6 10 0	5 10 0	5 10 0	5 15 0	6 5 0

WROUGHT-IRON TUBING,

Subject to 50 per cent. Discount.

	2 in.	1½ in.	1¼ in.	1 in.	¾ in.	½ in.
	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
Patent Welded Tubes, from 2 to 12 feet—per foot	1 8	1 0	0 10	0 7	0 5	0 4½
Ditto ditto, from 6 inches to 18 inches—each	3 0	2 0	1 9	1 3	1 0	0 9
Connecting-pieces, or Long Screws	3 6	2 3	2 0	1 6	1 2	0 11
Bends, Springs, and Elbows (wrought iron)	3 9	2 3	1 9	1 0	0 10	0 8
Tees, wrought or cast	4 0	2 6	2 0	1 6	1 1	0 10
Crosses, ditto	4 6	3 0	2 6	2 0	1 6	1 2
Iron Cocks	17 6	9 6	7 6	4 6	3 3	2 6
Ditto, with brass plug	28 0	15 0	13 0	7 0	5 6	4 6
Diminishing Sockets, Caps, Plugs, and Nipples	1 3	0 9	0 8	0 6	0 5	0 4
Plain Sockets	1 0	0 8	0 7	0 5	0 4	0 3
Syphons, 2-quart	15 0	14 0	13 6	13 0	12 0	—

GAS COALS.—*Per Ton.*

Newcastle.—Unscreened:—

East Castle, Haswells, Nettlesworth Primrose, and South Pelaw	7s. 6d.
Felling, North Pelton, Redheugh Main, Walker's Primrose, West Wear, and Whitwell Primrose	7 9
Burnhope, Craghead, Charlaw, Derwent, Edmondsley, Eighton Moor, Hartlepool Pelaw, Holmside, Lambton's Gas, Lanchester Pelaw, Medomsley, Mickley, New Pelaw, Pelaw Main, Ravensworth, South Moor Pelton, South Leverson, Townley Main, Tyne Main, West Pelaw, Wearmouth Hutton, and Witton	8 0
Peareth, Ravensworth Pelaw, Waldridge, West Garesfield, and West Pelton	8 3
Brancepeth, Dean's Primrose, New Pelton, Pelton, South Peareth, Stella, Urpeth, Washington Hutton, and West Leverson	8 6
Ramsay's Newcastle Cannel	20 0
Wigan Cannel (at Liverpool)	17 0

Scotch Cannel:—

Boghead (at Leith)	55 0
Kirkness, best (at Burntisland)	28 6
Capeldrae, 1st quality (at ditto)	28 6
Ditto, 2nd ditto (at ditto)	18 6
Cowdenbeath	12 0
Leamahago (at Glasgow)	31 6
Ditto (at Granton)	30 0
Arniston	27 6
Wemyss	20 0
Haywood, Wilsontown (at Granton)	23 0
Pirnie	15 0
Lothian's Cannel (at Leith)	28 0
Myles' Cannel	23 6

FREIGHTS.

Coastwise—Newcastle.—Per Ton:—

Chatham and Rochester	5s. 9d
Cork	9s. to 9 6
Dover, Folkestne, & Ramsgate	6 6
Dublin	9s. 6d. to 10 0
Exeter Quay	9 0
Ipswich	—
London (from Leith)	8s. to 8 6
London (Pool)	6s. 3d. to 6 6
Lowestoft and Yarmouth	4 9
Portsmouth & Southampton	7 9
Plymouth	8 0
Shoreham	7s. to 7 6
Whitstable	5s. 6d. to 6 0
Weymouth	8 0

Foreign.—Per Keel:—

Barcelona	£20 0
Bordeaux	13 0
Boulogne and Calais	7 0
Cadiz	11 0
Cronstadt	8 15
Copenhagen	7 10
Genoa	19 0
Hamburg	8 0
Havre de Grace	8 10
Leghorn	18 0
Lisbon	12 0
Rotterdam	7 10
Stettin	9 0
Trieste	19 0
Venice	21 0

SUNDRIES.

Best Nstle. Fire-bks., p. 1000, £2.10s. to £2	15 0
Cliff's Fire-bks. (at Wortley), p. 1000.	2 15 0
Ingham's ditto (at Wortley), p. 1000.	2 15 0
Fire-clay Retorts, p. ft. run, 5s. 6d. to	0 7 6
Tough Cake Copper, p. ton	82 0 0
English Pig Lead, p. ton	19 10 0
Welsh Bar Iron (in London), p. ton.	6 10 0
Foreign Spelter, p. ton	22 0 0
English Block Tin, p. ton	90 0 0
Banca, p. ton	93 0 0
Tarred Rope Yarn, p. cwt.	1 0 0

Advertisements.

1862.

PATENT ANTIMONY PAINT.

MADE ONLY BY

GEORGE HALLETT & CO.,

296, ROTHERHITHE, LONDON, S.E.

CLASS II.

This Paint having been in general use over four years (especially in some of the principal Gas-Works), and proved itself the best light-coloured Paint produced for resisting the influence of vitiated atmospheres, it is important that its qualities should be more widely known.

It is not discoloured like white lead in a sulphuretted atmosphere, nor washed off like white zinc; and its light colour reflecting heat, produces much less expansion of gas in holders painted with it than with dark colours, besides rendering them much more sightly. Its specific gravity is so much below white lead that the same weight will cover one-third more surface, while it is equal in body; and its price being about the same (28s. per cwt.), it is actually one-third cheaper. From experience, its manufacture is greatly improved, and it is quite suitable for all purposes in which white lead is employed.

Reference is kindly permitted by the Engineers of the City of London, Commercial, London, and Surrey Consumers Gas Companies, who pronounce it the best Paint known for their purposes.

N.B.—Antimony Paint, COVERING SO MUCH MORE WORK, costs under 20s. per cwt., as compared with White Lead at 28s. per cwt.

WILLIAM & BENJAMIN COWAN,

(ESTABLISHED 1827,)

WET AND DRY
GAS-METER MANUFACTURERS,

BUCCLEUCH STREET WORKS, EDINBURGH.

KROMSCHROEDER AND CO.,

GAS ENGINEERS,

PATENTEES AND MANUFACTURERS OF

WET AND DRY GAS-METERS.

IMPERIAL METER-WORKS,

KING'S ROAD, CAMDEN TOWN,

LONDON, N.W.

ORLANDO BROTHERS'
SELF-ACTING DISTRICT GOVERNOR.

Prices, according to size, can be obtained upon application to

Mr. WILLIAM ARCHER,

METER COMPANY'S WORKS, OLDHAM.

E. J. & J. PEARSON,

DELPH & TINTAM ABBEY FIRE-CLAY & BRICK-WORKS,

STOURBRIDGE,

PROPRIETORS OF

BEST GLASS-HOUSE POT & CRUCIBLE CLAY;

MANUFACTURERS OF

GLASS-HOUSE POTS, CRUCIBLES, GAS-RETORTS, & FIRE-BRICKS OF EVERY DESCRIPTION.

ECONOMY IN GAS PURIFICATION.

Mc DOUGALL'S

HYDRATED PEROXIDE OF IRON.

This Oxide is now well known, and has commended itself for efficiency and durability. It is free from any mixture of sawdust or other material, every particle being available for use, thus causing the Purifiers to work double the time before it requires renewing. It readily takes up sulphur, revivifies rapidly, and lasts longer than any other Oxide in the market. Prices on application to—

ALEX. Mc DOUGALL, Manufacturing Chemist,

LONDON—11, Arthur Street West, London Bridge, E.C.; MANCHESTER—Riga Street, Shudehill.

LLOYD AND LLOYD,

ALBION TUBE-WORKS, BIRMINGHAM,

MANUFACTURERS OF

WROUGHT-IRON TUBES & FITTINGS,

PLAIN, GALVANIZED, & ENAMELLED, for Gas, Steam, and Water, from $\frac{1}{8}$ in. to 6 in. bore.

STOCKS, TAPS, and DIES, GUN METAL GLAND-COCKS, WATER-GAUGES, &c.

PATENT LAP-WELDED IRON TUBES

For Locomotive and Marine Boilers, &c.

LONDON WAREHOUSE—No 66, QUEEN STREET, E.C.

WANTED, at the Middlesex County Lunatic Asylum, Colney Hatch, a FOREMAN of Gas-Works. He must thoroughly understand the manufacture of gas, and will have the charge of the whole of the gas plant, and the repairs of the fittings throughout the Asylum. Quantity of gas at present made 40,000 per day. Wages 35s. a week, with a comfortable house, and a garden. Coals and light.

Apply personally, or by letter, with testimonials, to the STEWARD, at the ASYLUM.

WANTED, a Draughtsman, who has a general knowledge of machinery, and can take out quantities. If accustomed to gas work preferred. A well qualified and energetic man will find this a desirable opportunity.

Address Y. Z., care of Mr. King, 11, Bolt Court, FLEET STREET, E.C.

LISBURN GAS-WORKS.

WANTED, on the 1st of July next, a MANAGER for the above work. He will be required, besides taking the general management of the works under the Chairman and Directors, to keep the accounts and take the indication of the meters, but not to collect the gas-rents. He must be competent to superintend alterations and additions to the works when needed.

Security to the amount of £200 will be required for the due discharge of the duties of the situation.

Salary £160 a year, with a residence, office houses, and gardens.

Applications, with testimonials as to character, ability, and experience, to be forwarded to "The Chairman of the Lisburn Gaslight Company, Limited," before the 1st of May next.

Lisburn, Co. Antrim, Ireland,
March 1, 1867.

TO GAS ENGINEERS AND OTHERS.

A Good Practical Retort-Setter, who understands all kinds of fire and out-door work, is in want of EMPLOYMENT, in town or country, to do the above work, either by contract or by the day.

Apply, in the first place, to WM. SCOBLE, next door to the Compasses, Wandsworth Road, SOUTH LAMBETH.

WANTED, an Appointment as In- spector of Meters, or Inspector and Fitter, or to Manage a small Work. Is thoroughly acquainted with the making and distribution of gas, laying of pipes, and gas-fitting. Is a good clerk, and can give excellent references as to character and ability.

Address A. B., 127, Lillington Street, PIMLICO, S.W.

TO GAS COMPANIES.

WANTED, by a respectable Man, a SITUATION in town, country, or abroad. Is thoroughly acquainted with proving, repairing, and fixing wet any dry gas-meters. Can take state of indexes, &c. Age 37, and has nine years good character.

Address M. P., 4 Mortimer Place, Whitmore Road, HOXTON, N.E.

AS SECRETARY, ASSISTANT SECRETARY, OR CONFIDENTIAL CLERK.

WANTED, by a Gentleman, an ENGAGEMENT as above. The advertiser has been engaged, for the last five years, as Secretary of a very successful Gas Company, and previously, through life, in commercial pursuits. Age, 38 years. Salary desired, £250 per annum. The advertiser can produce the highest testimonials for integrity and ability from present and former employers, and also references for respectability from City firms to whom he is well known.

Address B. W., care of Mr. King, 11, Bolt Court, FLEET STREET, E.C.

WANTED, in May next, a Situation as MANAGER of Gas-Works, where the yearly make of gas is about 6 or 8 millions. Has now the management of works which realized a profit last year of 9½ per cent. Testimonials from past and present employers.

Address T. G. D., care of Mr. King, 11, Bolt Court, FLEET STREET, E.C.

A GENTLEMAN who has had con- siderable experience in the designing, erecting, and managing of Gas-Works, at home and abroad, desires to obtain another engagement as MANAGER or ACCOUNTANT to a Gas Company or Corporation. Has first-class testimonials, and can give security if required.

Address D. W., care of Mr. King, 11, Bolt Court, FLEET STREET, E.C.

BALANCE-SHEETS AND REVENUE ACCOUNTS.

A FIRM of Accountants, much engaged in the preparation of Gas Companies Accounts, are open to contract for the keeping, balancing, or auditing the books of other Companies, which, from their experience, they are enabled to do on moderate terms.

Address, SANDELL & MADDERS, Accountants, 4, Skinner's Place, Size Lane, LONDON, E.C.

THE Directors of the Great Central Gas Company are prepared to receive TENDERS for the supply of 500 cubic yards of WHITE FLARE BURNT LIME, to be delivered either on to their works at Bow Common or at a wharf in the Lea Cut, in quantities of from 20 to 30 yards per week. Deliveries to commence about the 14th of April next.

Tenders to be delivered at the Company's Office, 28, COLEMAN STREET, E.C., on or before the 27th of March, 1867.

CRYSTAL PALACE DISTRICT GAS COMPANY.

NOTICE is hereby given that the ORDINARY HALF-YEARLY GENERAL MEETING of the SHAREHOLDERS of this Company will be held at the Albion, Aldersgate Street, London, on THURSDAY, the 28th inst., to receive the Report of the Directors, and the Balance-Sheet confirmed by the Auditors; to declare a Dividend, and for general business.

The Chair will be taken at half-past Three o'clock precisely.

By order of the Board,
MAGNUS OHREN, Secretary.

Offices, Lower Sydenham, S.E., March 8, 1867.

COMMERCIAL GAS COMPANY.—NOTICE is hereby given that the next ORDINARY MEETING of the Company, will be held at the London Tavern, Bishopsgate Street, in the City of London, on FRIDAY, the 5th day of April next, at Twelve o'clock at Noon, to receive the Report of the Directors, and to declare a Dividend to the 31st day of December last.

The following Directors—viz., Charles S. Butler, Esq., M.P., William Christie, and Thomas Latham, Esqrs.—will go out of office by rotation, who, being eligible for re-election, offer themselves accordingly; and the Board of Directors unanimously recommend those gentlemen to the Proprietors for re-election. George Ilsley, Esq., Auditor, will go out of office by rotation, who, being eligible, has given notice of his intention to offer himself for re-election.

The Books of the Company will be closed for the Transfer of Shares from the 21st day of March to the 5th day of April, now next ensuing.

By the Company's Act of Incorporation, Shareholders can inspect the Books of the Company during one fortnight before and one month after the Meeting.

By Order of the Board,
GEORGE JAQUES, Secretary.

Stepney, March 13, 1867.

SOUTH METROPOLITAN GAS- LIGHT AND COKE COMPANY.

NOTICE is hereby given that an ORDINARY MEETING of the PROPRIETORS of this Company will be held at the London Tavern, in the City of London, on MONDAY, the 8th day of April next, at Two o'clock precisely, to receive the Directors Report, and the Accounts of the Company for the half year ended December 31 last, to declare a Dividend, and to elect a Director in place of Thomas Bridge Simpson, Esq., and an Auditor in place of A. F. Paull, Esq., who retire from office at this Meeting, but, being eligible, offer themselves for re-election.

Any Proprietor holding Forty Shares, intending to become a candidate for either of these offices, must give notice in writing at the Office of the Company, at least fourteen days previously to the day of election.

By order,
THOMAS LIVESEY, Secretary.

Old Kent Road, March 16, 1867.

BRIGHOUSE GAS-WORKS.

MANAGER WANTED.

THE Brighouse Local Board, executing the powers of "An Act for Sewering, Draining, and Lighting the Hamlet of Brighouse, in the Township of Hipperholme-cum-Brighouse, in the Parish of Halifax, in the West Riding of the County of York," hereby give NOTICE that they are prepared to appoint some competent person as MANAGER of their Gas-Works, at which about 18¼ million cubic feet of gas are produced per annum. The person to be appointed will be required to superintend the works and the men employed, and to be fully acquainted with the process of manufacture of gas. It will also be his duty to keep the gas-rent accounts, and to prepare the drainage and lighting; and the highway rates for the district, and such accounts of the Board as relate thereto. He will have the assistance of a clerk in the Office, and all the rates and rents are got in by a collector appointed for the purpose.

Security to the amount of £200 will be required.

Candidates are requested to state in their applications the amount of salary they are willing to accept, and to forward such applications, with testimonials, to me on or before the 21st of March next.

Further information that may be required can be obtained on applying to me.

By order of the Board,
T. B. CHAMBERS, Clerk.

Brighouse, Feb. 26, 1867.

TO BE SOLD, at the Works of the Crystal Palace District Gas Company, STEAM ENGINE BOILER, GAS APPARATUS, &c., being too small for the present requirements of the Company—viz.:

1 well-finished 6-horse Horizontal Steam-Engine.
1 6-horse Tubular Boiler, with fittings, complete.
2 Beale's Exhausters, to pass 20,000 ft. per hour.
2 do. do. to pass 10,000 ft. per hour.
2 sets of Shafting, Valves, &c.
2 of Wright's Exhauster Governors.
2 capital 12-in. Condensers.
4 8-ft. square Purifiers, with valves and lifting apparatus complete.
1 Station-Meter, to pass 10,000 feet per hour, with valves, &c., complete.
1 6-in. Governor, with valves, &c.

Also sundry 12-in. Valves and Irregular Pipes and Connexions.

The above apparatus is all in good condition, some of it being quite equal to new, and will be sold at a low price for immediate removal.

Particulars and prices to be obtained on application to Mr. E. S. Cathels, the Engineer.

By order of the Board,
MAGNUS OHREN, Secretary.

Offices at the Works, Lower Sydenham, S.E.

TO GASHOLDER MAKERS.

THE Gas Company, Worcester, intend in the spring of 1868 constructing a TELESCOPIC GASHOLDER, 138 ft. diameter, by a depth for the upper lift of 31 ft., and for the lower of 30½ ft., and solicit tenders for the work.

Further information may be obtained, specifications (31s. per copy) can be had, and the drawings seen at the Company's Offices, WORCESTER, and with Mr. WILLIAM ESSON, Engineer, Ness House, CHELTENHAM.

Tenders for the work will have to be delivered free to JOSIAH STALLARD, Esq., Chairman of the Company, on or before noon, the 2nd of May next.

Worcester, March 15, 1867.

TO GASHOLDER MAKERS.

THE Directors of the Grantham Gas Company invite TENDERS for TELESCOPING a 60-ft. GASHOLDER, by 20 ft. deep.

Plans and specification may be seen at the Offices of the Company, Finkin Street, GRANTHAM. Tenders, to be endorsed "Tenders for Gasholder," addressed to the CHAIRMAN of the Company, must be delivered on or before Saturday, the 30th of March inst.

Grantham, March 8, 1867.

TO GAS ENGINEERS.

THE Directors of the Kingsbridge Gas Company are desirous of receiving Plans, Specifications, and Tenders for supplying and erecting, during the ensuing summer, a NEW TELESCOPE GASHOLDER, complete, rising 24 ft. in two lifts of 12 ft. each, exclusive of the seal. The outer lift to be 30 ft. in diameter. Every portion of the apparatus necessary for the erection and completion of the Gasholder to be supplied by the Contractor, including the foundation bolts for holding down the columns; but the Company are prepared to excavate and build the tank, and supply and fix the inlet and outlet pipes. The Contractor deciding on the positions of the foundation bolts, &c., forthwith.

Tenders, accompanied by plans and specifications endorsed "Tender for Gasholder," to be sent not later than Tuesday, the 16th day of April proximo, to the Secretary of the Gas Company, Kingsbridge, Devon, of whom any further information may be obtained.

No allowance will be made for plans, specifications, or tenders; nor do the Directors pledge themselves to accept the lowest or any tender.

By order of the Directors,
W. JARVIS, Secretary.

Kingsbridge, March 6, 1867.

TO GAS ENGINEERS.

THE Directors of the Wotton-under- Edge Gas Company are prepared to receive TENDERS for new CONDENSERS and VALVES.

Particulars may be known on application at the works.

HENRY CLARK,
Secretary.

TENDERS are Wanted by the Directors of the Aldershot Gas and Water Company, for the PURCHASE of the almost new manufacturing plant of a small Gas-Work, capable of making 3,000,000 feet annually.

A preference will be given to any one taking the whole, which can be seen by applying at the Office, Bank Street, ALDERSHOT.

TENDERS FOR GAS COALS.

THE Directors of the Stratford-upon- Avon Gas Company are prepared to receive TENDERS for the supply of COALS to their Works, from the 1st of May, 1867, to the 1st of May, 1868.

Further particulars may be obtained from the Secretary, Mr. HENRY CRANMER, Gas-Works, STRATFORD-UPON-AVON.

CONTRACT FOR BREEZE.

THE Directors of the Imperial Gas Company are ready to receive TENDERS from parties willing to purchase the BREEZE made at their several works—viz.: At Fulham, St. Pancras, and Haggerstone, for one year from the 31st of March, 1867.

Forms of tender may be obtained on application to the SECRETARY of the Company, at the Office, 33, John Street, BEDFORD ROW, to whom the tenders must be sent on or before Tuesday, the 26th inst.

The Directors will not be bound to accept the highest or any tender.

33, John Street, Bedford Row, March 13, 1867.

FOR SALE, a set of 4 Cast-Iron Dry-Lime PURIFIERS, 10 ft. square and 3 ft. 6 in. deep inside, together with hydraulic centre-valve for 10-in. connexions, and 2 sets of cast-iron girders, 46 ft. 3 in. long, with lifting crabs.

Also a 30,000 feet per hour BEALE'S EXHAUSTER, with 8-in. Walkers' valves.

A 12-in. PARKINSON'S STATION-GOVERNOR.

All in excellent order, and sold in consequence of larger being substituted.

Application to be made to the MANAGER of the Leicester Gas-Works.

FOR SALE.—Nine New Cast-Iron D RETORTS, each 8 ft. long; a large number of RETORT-HOUSE CONNEXIONS, 3, 4, and 5 in.; and a large number of Wrought-Iron LAMP-BRACKETS and STAYS.

Particulars can be had on application to the Cork Gas Consumers Company, Limited, 72, South Mall, CORK.

Jan. 4, 1867.

FRASER'S PATENT RETORTS.

THE RIBBED IRON RETORTS

Have now been in use about three years, and continue to give satisfaction. The

PATENT CLAY RETORTS

Will work off the Gas from the Coal in less time, and Carbon does not form in them so freely, nor adhere so firmly, as to Plain Retorts.

Further particulars and prices on application to Mr. A. C. FRASER, Engineer to the Gas Company, COLCHESTER.

JAMES MILNE & SON,

GAS ENGINEERS,

Gas-Meter, Gas Apparatus, and Gasfittings Manufacturers,

EDINBURGH, AND

2, KING EDWARD STREET,

NEWGATE STREET, LONDON.

Station-Meters, Governors, Consumers Meters, Gas Lustres, Chandeliers, Brackets, &c., and every description of Gasfittings and Gas Apparatus.

MARTIN'S

LEE MOOR PORCELAIN FIRE-BRICKS,

Containing no Lime, and only ·45 of Oxides, resist the strongest heats, and will last for Gas-Works longer than any others.

Samples and prices sent, and the highest references given, on application to

MARTIN BROTHERS,

ST. AUSTELL, CORNWALL.

WALTER FORD,

159, GRAY'S INN ROAD, LONDON.

MANUFACTURER OF WET AND DRY GAS-METERS, STATION-METERS, GOVERNORS, &c. &c.

Sole Manufacturer of **PADDON'S PATENT STREET-LAMP REGULATORS,** for insuring any required consumption. These Regulators are in general and increasing use, and references can be given to Gas Companies who use them for every Lamp.

JOSEPH BOULTON,

80, KING'S CROSS ROAD, AND

10½, GREAT PERCY STREET, CLERKENWELL.

Manufacturer of the Patent Dry and Improved Unvarying Water-Line Gas-Meters and Station-Meters, Governors, Experimental Meters, and Pressure Gauges, on the most improved principle.

Old Meters thoroughly repaired, and altered to meet the requirements of the Act of Parliament.

ALL METERS WARRANTED.

PATENT ECONOMIZERS,

ADAMAS-POINTED,

Union Economizer, 1-10th real size of Flame.

Bat's-wing Economizer, 1-10th real size of Flame.

Ensure a large, well-shaped, steady flame. The aperture never wears out, thus attaining uniformity of consumption, great brilliancy of light, freedom from roaring, flickering, or waste of Gas, and no smell of sulphur. One gives more light than a triple-branch ordinary burner.

At the Expense of not quite One Penny for full five hours, a most cheerful light is obtained, surpassing the illuminating power of Twelve best Sperm Wax Lights.

The combustion is perfect; there is no escape of carbonic acid, carbon (or Soot), to discolour the ceiling, or injure the furniture.

All sizes kept in stock, suitable for cannel, mixed, and common gas, plug or taper screwed, to take the place of any old burner.

TESTIMONIAL.

Gas-Works, Portsea, January 2, 1867.

Dear Sirs,—I cordially respond to your invitation to give my opinion of your "ECONOMIZER." We have now not less than 8000 in use, all of No. 6 size, bat's-wing and fish-tails; and in no single instance have they failed to give a brilliant light, well-formed, and unaltered from day to day, with a minimum consumption of gas. Every gas engineer, who has had to struggle with the complaints of his customers, knowing them to arise solely from imperfect combustion of the gas for light-giving purposes, should introduce these burners, and he will find what I have found, universal satisfaction, in place of a great deal of discontent. On the other hand, the consumer will find it to his advantage to CONSUME his gas through this burner, as he will really get the value of what he is paying for. I can affirm with perfect confidence that this Company's consumers who now use this burner would not part with it if it cost six times as much.—I am, dear sirs, yours very truly,

J. DOUGLAS, Superintendent and Secretary, Portsea Island Gaslight Company.

Messrs. Lambert Brothers, Walsall.

LAMBERT BROTHERS, Tube Mills, Gas-Fitting Manufactory,

WALSALL.

Agents supplied with Show-Cards and Tables of Consumption.

TO prevent complaints of inferior Gas, use the best FLINTSHIRE GAS CANNEL.

For contract supply, apply to STRANGE BROTHERS & Co., Gas Coal Merchants, Mold, FLINTSHIRE.

SAMUEL CUTLER, Gasholder

MAKER and CONTRACTOR

For Tanks, Roofs, Purifiers, Condensers, Erection and Alteration of Works and every description of GAS APPARATUS.

PROVIDENCE IRON WORKS,

MILL WALL, POPLAR, LONDON, E.

Main Laying and Gas-Works erected complete.

AUCHINHEATH, Lesmahago, Gas COAL, known in the market for the last fifty years as a first-class gas coal.

JAMES FERGUSON and CO.,

Sole Lessees of the Auchinheath Coal-Field, are prepared to ship the above at Glasgow, Greenock, and Ardrossan, on the west coast of Scotland; and at Granton or Leith, in the Firth of Forth, on the east coast. Also to forward them to any railway-station in Scotland or England.

Price and other particulars may be learned by addressing

JAMES FERGUSON and CO.,

GAS COAL WORKS,

LESMAHAGO.

CITY OF ELY LOCAL BOARD OF HEALTH.

LIGHTING WITH GAS.

NOTICE is hereby given that the Local Board of Health for the district of the City of Ely will be prepared at their MEETING, which will be held at the Grand Jury Room, in the Shire Hall, in Ely, on WEDNESDAY, the 20th day of March next, at Twelve o'clock at noon, or at some adjournment thereof, or at some subsequent meeting or adjournment thereof, to enter into a contract for a period of three years, from the 1st day of August next, with any company or person, for the SUPPLY of GAS, for lighting the streets, roads, and other open places, markets, and public buildings, situate within the said district, or such and so many of them as they may from time to time appoint or determine.

And Notice is hereby further given that any company or person willing to undertake the same are invited to make proposals or send in tenders for that purpose at the aforesaid meeting.

N.B.—The present annual season for lighting is from the 1st day of August to the last day of May, and so far further as shall include the period of the Ely Summer Fair, which commences on Ascension-day, or Holy Thursday, and the hours of lighting from sunset to sunrise, or within half an hour of each of those periods respectively.

The Local Board request that alternative tenders may be sent in, one containing the gross sum per puplic lamp per annum, for which such company or person will undertake to light the same, inclusive of the expense of lighting, extinguishing, cleaning, painting, and repairs, and the other the price per 1000 cubic feet (to be ascertained by test meters), such last-mentioned price to include also the costs of lighting, extinguishing, cleaning, painting, and repairs, as above.

The person or persons or company whose tender is accepted will be required to enter into a contract, with sureties, containing stipulations as to the mode of payment, quantity, and quality supplied, penalties for non-lighting, &c., &c., a copy of which can be seen on application to the Clerk.

The Local Board do not bind themselves to accept the lowest or any tender.

By order of the Board,

W. MARSHALL, Clerk.

Ely, Feb. 21, 1867.

THOMAS LAMBERT & SON,

SHORT STREET, LAMBETH, LONDON.

CARTER'S SAFETY GAS-VALVES,

Made to suit every Description of Fittings.

Section of Valve open.

Manufacturers of

WROUGHT-IRON PIPES AND FITTINGS

SLUICE-VALVES AND STOP-COCKS,

STOCKS, TAPS, & DIES,

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PATNET MERCURIAL GAS-REGULATORS.

CAST-IRON Retorts, Socket Pipes, with Syphons and all requisite Connexions, Lamp Columns, Wrought Iron Tubing, Valves, Street Lamps, Sight Holes, Furnace Doors, Ash Pans, Charging and Coke Shovels, Iron Pails and Coke Barrows, Cross Bars, Fire Pots, Pumps, Iron Bearings.

PURIFIERS, CONDENSERS, and SCRUBBERS erected complete, or the materials supplied; with every description of goods in use by Gas-Works, in stock, on wholesale prices, at

Mr. LYNCH WHITE'S,

Old Barge Iron Wharf, Upper Ground Street, LONDON.

TO GAS ENGINEERS & CONTRACTORS.

THE Directors of the Neath New Gas Company are desirous to receive TENDERS for the erection of NEW GAS-WORKS at Neath.

Plans and specifications may be seen on and after the 25th of March, 1867, at Messrs. PORTER'S, Gas Engineers, 7, John Street, Adelphi, LONDON, and at Mr. RANDALL'S, Solicitor, NEATH.

The detail of construction and patterns may be optional with the Contractor, subject to the approval of the Directors.

Sealed tenders to be sent on or before the 6th of April, 1867, addressed to the said Mr. RANDALL.

CONTRACTS FOR GAS COALS.

THE GOSPORT GAS AND COKE COMPANY.

THE Directors of the above Company are prepared to receive TENDERS for the supply of 3000 tons of unscreened good GAS COALS, to be delivered AFLOAT in Portsmouth Harbour in such quantities as may be demanded, in the months of June, July, August, September, October, November, December, January, and February, in cargoes about 300 tons; rate of delivery 1½ keels per working day. The Coals to be dry and of good quality, and free from dirt, slag, or other admixture.

The tenders to state the names of the Coals offered to be supplied with the respective prices of each.

Terms of payment by two months bills, payable in London.

Tenders to be delivered to the Secretary and Treasurer on or before the 2nd day of April next, endorsed "Tender for Coals."

The directors do not bind themselves to accept the lowest or any tender.

HENRY COMPIGNÉ,
Secretary and Treasurer.

Newtown, near Gosport, March 8, 1867.

TENDERS FOR TAR.

THE Directors of the Western Gas-light Company, Limited, are prepared to receive TENDERS for the TAR to be produced at their works for the year ending May 1, 1868.

Particulars as to quantity and delivery may be obtained on application to the ENGINEER, at the Works, KENSAL GREEN.

Tenders to be sent to the Offices of the Company, 28, Argyll Street, Regent Street, or or before Wednesday, the 27th inst.

The Directors do not bind themselves to accept the highest or any tender.

March 19, 1867.

WOLVERHAMPTON RETORT WORKS.

ESTABLISHED 1840.

JOHN EUNSON AND SON,

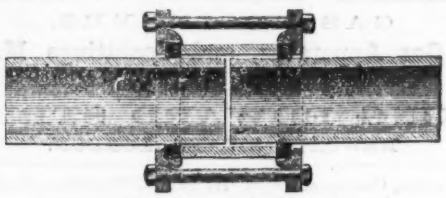
GAS ENGINEERS, AND MANUFACTURERS OF CLAY RETORTS,
AND FIRE GOODS IN GENERAL,

WOLVERHAMPTON.

Retort Mouthpieces, Bolts, Nuts, and every description of Wrought-Iron Work.

DR. NORMANDY'S

PATENT PIPE-JOINTS.



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A. NORMANDY and CO., Engineers and Ironfounders,

HOLLY BUSH PLACE, BETHNAL GREEN ROAD, LONDON, N.E.

Also Sole Manufacturers of the Patent Marine Aërated Fresh-Water Apparatus, Steam Pumps Steam Winches, &c.

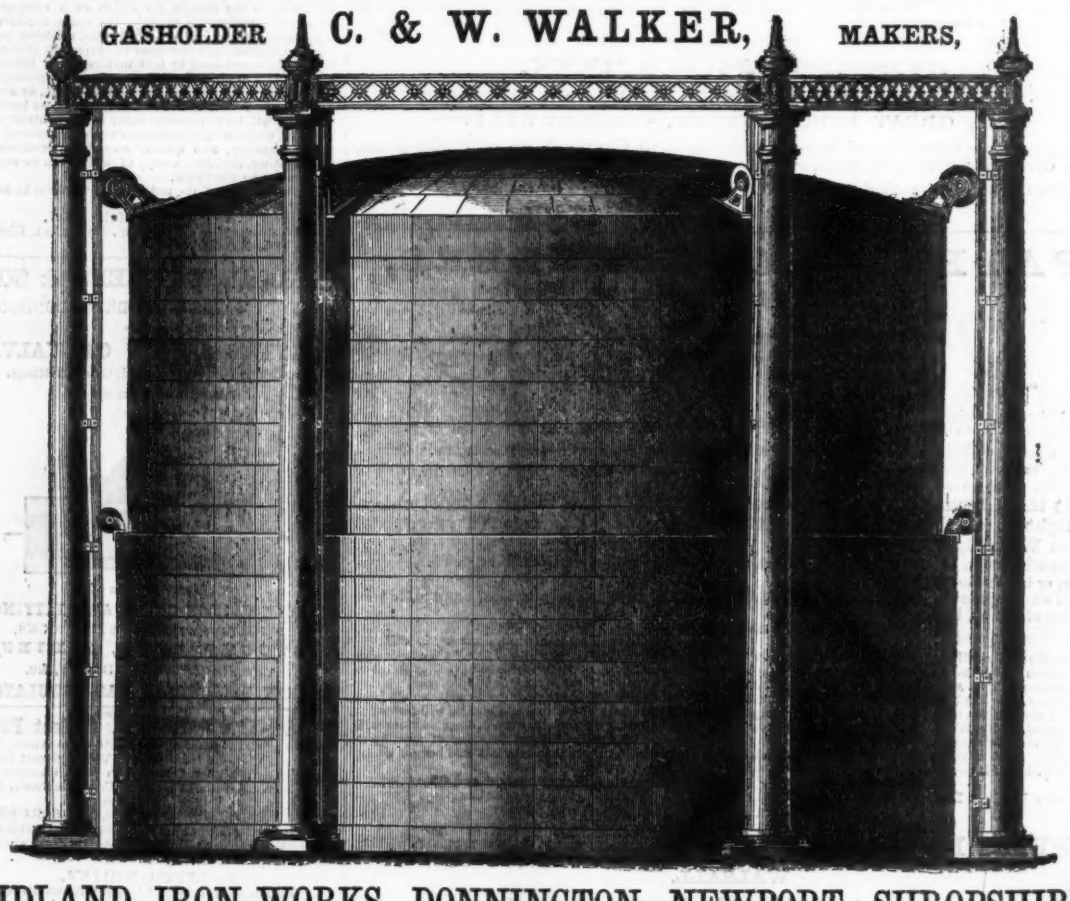
These Joints have been in use nearly three years on gas-mains, and are still perfectly sound. They have also been proved quite sound under a pressure of 680 feet head of water.

The advantages which these Joints offer are economy, perfect soundness and durability, ease and rapidity of application, use of perfectly plain pipes, so that a tight Joint may be made with cut pipes, even though the ends do not come close together. Any ordinary labourer is capable of securely fixing them.

These Joints are particularly applicable to gas, water, and suction pipes, and remain permanently sound; they are cheaper than the socket-joint, as they save the lead, the gasket, the iron forming the socket (which in a 3-inch main amounts to 10 lbs.), and the fire for melting the lead. There is also considerable saving of time, more than four Joints being made in the time required for making only one of the others, and by unscrewing the bolts, a pipe can be removed and replaced with the greatest facility.

By means of these Joints, which are made of all sizes, pipes made of either wrought or cast iron, copper, lead, tin, earthenware, glass, bitumen, gutta-percha, suction-hose, &c., may be rapidly and soundly united, and taken apart with facility.

GASHOLDER C. & W. WALKER, MAKERS,



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KIRKWOOD CANNEL COAL.
This Coal is largely used in the Gas-Works at Glasgow, Paisley, Port Glasgow, Edinburgh, Leith, and many other towns throughout Scotland. It yields 10,648 cubic feet per ton; illuminating power, 27·55 standard candles; coke per ton, 9 cwt. 83 lbs. Railway communication from the pits (at Coatbridge) to all parts of the country; ports of shipment in Firths of Forth or Clyde.
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FIRE-CLAY GAS-RETORTS, &c., CANNEL AND STEAM COALS.
WILLIAM FRASER, Inverkeithing
(owner of the Works at which Fire-clay Retorts were first made), having greatly enlarged his works, can supply retorts and other fire-clay goods to any extent.
References can be given to managers of above a hundred Gas-Works whom he supplies.
WILLIAM FRASER ships COWDENBEATH PARROT COALS at Charlestown and Burntisland at 11s. per ton; and HALBEATH STEAM COALS, on Navy List, at 8s. 6d. per ton.

JAMES OAKES and CO.,
ALFRETON IRON WORKS, DERBYSHIRE,
AND
WENLOCK IRON WHARF, 20, WHARF ROAD, CITY ROAD, LONDON,
Beg to inform Gas and Water Companies and the public, that they keep in stock in London all the CASTINGS in general use in Gas and Water-Works, including Iron Retorts, Socket and Flange Pipes, Bends, Branches, and Syphons of all sizes, Lamp Columns, &c., &c.
N.B.—Orders for Cast-iron Tanks, Girders, Columns, Cylinders, and all irregular castings, will have immediate attention.
CHARLES HORSLEY, Agent.

OXIDE OF IRON,
We are prepared to supply, on moderate terms,
HYDRATED PEROXIDE OF IRON (BOG OCHRE),
Same quality as supplied by us to several of the most extensive Gas Companies, and which has given entire satisfaction.
FRANCIS RITCHIE & SONS,
BELFAST.

INTERNATIONAL EXHIBITION,
1862. CLASS X.
PRIZE MEDAL
For excellence of Fire-Clay Gas Retorts, and "HONOURABLE MENTION" for good quality of Fire-Bricks.
WILLIAM STEPHENSON & SONS,
THROCKLEY,
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THOMAS CARR & SON,
MANUFACTURERS OF
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SCOTSWOOD FIRE-BRICK WORKS,
NEAR
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BEST GLASS-HOUSE POT AND CRUCIBLE CLAY
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FIRE BRICKS, GAS RETORTS, &C.
AMBLECOTE FIRE CLAY AND BRICK WORKS,
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Late in the occupation of I. and W. King. Originally J. Pidcock, Esq.
NB A quantity of best Clay Retorts in stock, viz.—Circulars, 14 inches, 15 inches. 16 inches.
D's, 16×12, 15×14, 20×16, 16×18.

HANCOCK'S INDIA-RUBBER GAS-TUBING.
All sizes, from ¼ in. to 4 in. diameter and upwards.
Also,
HORSE SINGEING APPARATUS, best make, with GAS-BURNERS, COMBS, and INDIA-RUBBER TUBING, all complete.
INDIA-RUBBER BAGS for GAS-MAINS.
WASHERS for GAS and STEAM JOINTS.
VALVES (pure solid Rubber) for STEAM-ENGINES.
PACKING (Elastic) for STEAM-ENGINES.
FLANGE TUBING, for excluding Draughts and Dust through WINDOWS, DOORS, and GLASS CASES.

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Illustrated Price Lists on application.
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Patentees and First Makers of Wrought-Iron Tubes.

MR. G. W. STEVENSON, C.E., F.G.S.,
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CONSULTING ENGINEER,
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Plans, Specifications, and Estimates prepared.

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IRON MERCHANT,
31, BANKSIDE, LONDON, S.E.
SOCKET, FLANGE, HOT-WATER PIPES, AND ALL CONNEXIONS; RETORTS, HYDRAULIC MAIN, LAMP-COLUMNS, &c.; AND EVERY DESCRIPTION OF CASTINGS AND WROUGHT-IRON-WORK FOR GAS AND WATER-WORKS, STEAM, AND GENERAL PURPOSES.
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Manufactory for every description of Casting and Machinery for Gas-Works and Water-Works.
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BELGIAN CLAY RETORTS.
J. SUGG and CO., late ALBERT KELLER, Ghent.—The removal of the import duties on Earthenware permitting the entry of Clay Retorts into England, Messrs. Sugg, of Ghent, beg to draw the attention of the Gas Companies of London, and other Cities, to the very superior quality of the RETORTS manufactured by them. They can be made of any size, in one piece, and of any form. The price will be in proportion to the weight, and very moderate in comparison to their value.
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Manufacturer of Clay Retorts, Fire-Bricks, and every description of Fire-Clay Goods.

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Also,
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For Gas, Steam, Water, and other purposes.
GAS APPARATUS OF EVERY DESCRIPTION.
High-pressure Water-Valves and Cocks, &c., &c.
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GARDEN EDGINGS of various patterns.
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Works: 14, John Street, Pentonville Road, LONDON, N.
The above sieves are used by the principal gas companies in London and the country. Their utility, durability, and cheapness combined, render them superior to all others.
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GAS ENGINEERS,
MANUFACTURERS AND CONTRACTORS FOR GAS-WORKS
Of any extent at Home and Abroad,
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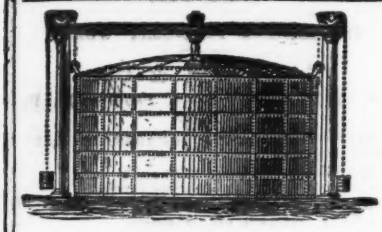

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WORTLEY FIRE-BRICK AND RETORT WORKS,

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W. INGHAM and SONS, having for many years been extensively engaged in the Manufacture of

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The Works are of such magnitude as to ensure the prompt execution of orders to any extent.

Estimates for Setting, or Bricklayers sent when required.

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A large stock of Fire-Bricks, Fire-Clay, Terra Cotta, and Drain-Pipes of all sizes kept in London at CHRISTIE & CO.'s Wharf, 64, Bankside, Southwark, where all particulars of Prices, &c., may be obtained.

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KING BROTHERS beg especially to call the attention of Gas Companies to the superiority of their Retorts, which are made from the celebrated STOURBRIDGE FIRE-CLAY. Mr. King has patented a Kiln for burning Retorts, by which Patent all Cold Air is excluded from the Kiln while burning, thus rendering them FREE FROM CRACKS AND CORRECT IN FORM. By great care in Manufacturing, combined with the advantages in burning, a VERY SMOOTH SURFACE is obtained, rendering them less liable to carbonize.

Retort Ovens, Fire-Bricks, Guards, Saddles, Rabbitted Bars, Flues, and Quarries, are all Manufactured of the same quality of Clay.

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IMPROVED CRYSTAL STAR

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SUN LIGHTS;

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AND

EVERY DESCRIPTION OF GAS-FITTINGS.

WORKS:

LONDON, BIRMINGHAM, & PARIS.

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Beg most respectfully to inform Gas Companies and the Trade that their

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Are now complete with every description of Lighting Mediums, including Registered Designs of Mediæval Gas-Fittings, Crystal, Bronzed, Ormolu, and Electro-Plated Chandeliers, Brackets, Vestibule-Lights, Bronzed and Gilt Statuettes.

Special Designs prepared in perfect accordance with architectural arrangements. Estimates furnished for the Lighting and Fitting up of Theatres, Music-Halls, and Public or Private Buildings with Gas.

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THE PATENT GAS-REGULATOR & PURIFIER

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Pattern Books of Gas-Fittings, Crystal and Ormolu Chandeliers for 1866-67, are now complete.

WORKS:

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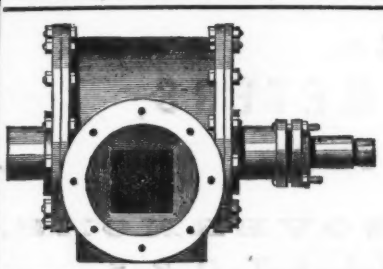

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MAKERS OF ENGINES, MACHINERY, and IRONWORK for GAS-WORKS,
efficient and durable TAR, LIQUOR, and SYPHON PUMPS,
GAS-VALVES, with or without Wedges, worked with powerful Worm and Rack,
SELF-ACTING BY-PASS VALVES, with Lid and Relieving Lever,
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RETORT SETTINGS, heated by tar without the production of smoke.
STEAM-ENGINES and EXHAUSTERS, separately or combined.
FOUR-WAY VALVES, one of which is equal to three ordinary Valves.
STATION GOVERNORS in which the Gasholder cannot tilt and cause accidents.

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"The Author is well qualified to speak authoritatively upon the important subjects to which his pamphlet refers."—ARTIZAN.

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THE

GAS-METER COMPANY, LIMITED,

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CROLL'S DRY GAS-METER,

(Invented and Patented in 1844, since which time 200,000 of these Meters have been manufactured by Mr. CROLL,)

Obtained **PRIZE MEDALS** at the EXHIBITIONS of London, 1851, of New York, 1853, and Paris, 1855.

IMPROVED in 1858,

And was awarded at the INTERNATIONAL EXHIBITION of 1862, the PRIZE MEDAL for

"GOOD CONSTRUCTION and SOUND WORKMANSHIP."

Now manufactured by the GAS-METER COMPANY, LIMITED, KINGSLAND ROAD, LONDON; and, for the purpose of obtaining greater accuracy in all its parts, the most perfect machinery has been adopted, "By which the construction of the Meter is much simplified, while its liability to get out of order is diminished." (See report of T. G. BARLOW, Esq., C.E.)

ALEXANDER WRIGHT & CO.,

MANUFACTURERS OF

WET METERS,

COMPENSATING WET METERS,

AND

IMPROVED DRY METERS

of the very highest excellence.

STATION-METERS AND GOVERNORS.

STREET-LAMP REGULATORS.

TESTING APPARATUS

of the most perfect description for all purposes relating to Gas.

KEELING'S PATENT STATION-GOVERNOR REGULATOR.

55 and 55a, MILLBANK STREET, WESTMINSTER, S.W., and COPENHAGEN.

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GLASGOW;

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MANUFACTURERS OF

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WROUGHT-IRON TUBES, FOR GAS, WATER, & STEAM; CAST-IRON RETORTS & PIPES,

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Contractors for Gas-Works of any Magnitude. *Plans, Specifications, and Estimates furnished.*

LONDON ESTABLISHMENT—190, STRAND.

D. HULETT and CO., 55 and 56, HIGH HOLBORN, LONDON,

PATENTEES and MANUFACTURERS of the ONLY GOOD MERCURIAL GAS REGULATOR,

invite the attention of Gas Companies and the Trade generally to their Improved GAS-METERS, which they warrant equal to any in Quality, Workmanship, and Simplicity of Construction, and the only Meters from which Gas cannot be obtained without being duly registered.

MANUFACTURERS OF

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DOUBLE CONE, ALBERT, SHADOWLESS, & EVERY DESCRIPTION OF BURNER, UNION JETS, BATSWINGS, ETC.;

IMPROVED FULL-WAY CARTER'S VALVES (much approved of);

GAS-STOVES, and every article connected with Gas Apparatus.

CAST & WROUGHT-IRON PIPE BLACK & GALVANIZED. COPPER, TIN, BRASS, & COMPOSITION TUBING.

D. HULETT'S IMPROVED SERVICE CLEANSER,

for clearing out Mains, Services, and Interior Fittings—65s. net.

Boyle's Patent Silvered Glass Combination Reflectors and Outside Lanterns.

Sole Manufacturers of Church and Mann's Photometer.

Large Pattern Books with every description of Gas-Fittings, Chandeliers, &c., with complete Book of Prices, 12s.

London: Printed by WILLIAM BOUGHTON KING (at the office of Clayton and Co., 17, Bouverie Street, Fleet Street); and published by him at No. 11, Bolt Court, Fleet Street, in the City of London.—Tuesday, March 19, 1867.